THE
VETERINARY RECORD.
The Official Journal of the National Veterinary Medical Association of Great Britain and Ireland.
FOUNDED BY WILLIAM HUNTING, F.R.C.V.S., 1888.

No. 1706. VOL. 33]. MARCH 19, 1921. [NEW SERIES, No. 12, VOL. I.

General Articles.

Joint-Ill in Foals: A Survey of Recent Investigations.*

BY PROFESSOR J. T. EDWARDS. M.R.C.V.S., B.Sc.,
Royal Veterinary College, Camden Town, London.

The clinical concept termed joint-ill, navel-ill, or pyo-septicæmia of the new-born has in the course of time undergone the fate of many other diseases of like nature: the clinician has tended to group together the disease processes represented by somewhat similar outward manifestations in one or more species of animals as a single morbid entity designated by a common term, while the subsequent investigations of the bacteriologist have frequently split them up again into etiologically different and often widely divergent affections. Thus, the common disease of the new-born of the bovine species—a disease which was regarded fairly generally by clinicians as having substantially the same characters as that of the equine species—is now known to be generally caused by an organism, or at least a group of closely-allied organisms, the coliform group, which we now know to be far from being the general cause of so-called joint-ill of foals, and that, moreover, the pathogenesis of the diseased conditions in the two species is usually not similar. There is, therefore, every reason for dealing with the subject of the foal disease or diseases from a separate standpoint, and we shall see later how this commonest morbidity of the young of the equine species must even be regarded as a number of separate and distinct affections, which, from the point of view of the therapeutist, should thus be attacked with specifically different weapons.

Until quite recently the problem of joint-ill in foals remained practically devoid of satisfactory solution, or at least had only been approached in a partial, desultory, manner. Not that it had been entirely neglected, for early in the bacteriological era BOLLINGER (1873) showed clearly that many cases of joint-ill were a pyæmia or pyo-septicæmia arising from a primary seat of infection at the navel, and that the infection of the navel wound took place at birth or very soon after birth. The primitive methods then in use did not enable him to deal with the nature of the virus present, but his work did much good in so far as attention became directed to the proper care of the navel at birth, an organ which in the foals appeared to be highly susceptible to act as a port of entry for invading organisms. Of particular interest in this connection is the work of GMELIN (1891), who traced the course of the infection along the umbilical vessels in a number (13) of foals, and suggested a most thorough method of treating the navel in the new-born, so as to eliminate any chances of infection along this channel.

The literature dealing with the course of joint-ill investigations has been admirably reviewed by the Swedish worker, MAGNUSSON, and interested persons are advised to consult his original article for this information (*Jl. Comp. Path. and Ther.*, 1919, Sept.).

* Paper read at the Annual Meeting of the Midland Counties Veterinary Medical Association, on February 11th, 1921.

The Etiology of Joint-Ill.

Among other works may be noted those of CASPER (1897) and OSTERTAG (1901), who incriminated purulent streptococci; SOHNLE (1901) isolated highly virulent staphylococci. . . . The result was that joint-ill came to be regarded as a pyosepticæmia set up by an invasion with a multitude of banal organisms—streptococci, staphylococci, coliform organisms—and this was the belief expressed in nearly all text books on the subject. For example, CADEAC (quoted by PANISSET) "considers that the inventory of the microbes is lengthy enough for one to assert that the septicæmia of the new-born and its localisations is the work of a microbial flora of the most diverse nature; all the saprophytes of the ground and manure threaten the animal that has just been born; but *Bacillus coli*, paracoli, and pseudocoli bacilli, streptococci, staphylococci, and pasteurella organisms each demand in turn pathogenic supremacy" (*Pathologie chirurgicale*, Joints, 1913).

The investigations published during the last four or five years have, however, indicated that a single case of joint-ill in a foal is not by any means the product of simultaneous invasion with such a varied host. There is reason to believe that in each case, with very few exceptions, infection is due to the presence in the local lesions or in the system generally of one type of organism. This does not mean that a single type of organism is responsible for every case of joint-ill. At one time it seemed feasible to some workers that this indeed was the actual fact, and that an organism (the organism which is the common cause of contagious abortion in mares) was also perhaps the most common cause of joint-ill. We now know that this is not true, and that "joint-ill" is the effect of invasion by an organism which may belong to any one of a number of groups of micro-organisms. In order to establish this point, it was necessary, of course, to have at hand for careful bacteriological examination as large a mass of material as possible, drawn from as many different localities as possible. Investigations which would satisfy these desiderata have been carried out by ADSERSEN working in Prof. Jensen's serum laboratory at Copenhagen, by MAGNUSSON, of the laboratory of the Agricultural Society of Malmö, Sweden, and by MCFADYEAN and EDWARDS working at the Research Institute, Royal Veterinary College, London, and on the whole the conclusions of these investigators are in remarkable concordance. One is not unmindful of the valuable results obtained by certain other workers in other fields, which have thrown considerable light on certain points.

The prime object in view of all such investigations has been the discovery of a product (serum or vaccine) that might be of some service for the preventive or curative treatment of affected foals. The benefit that would accrue from such a discovery to the horse-breeding industry is almost incalculable, for there is no doubt but that joint-ill is by far the most important of all the diseases of the foal. How many foals die in the country during the year from the disease we do not know, but the number must be very large; MAGNUSSON found that, out of 314 carcases of foals examined, 236, or three-quarters of the whole, had suffered from joint-ill. But, still bearing in mind the importance of the subject of therapy, one must also realise that the first necessity in order that one may be able to prepare a biological product of any value in the treatment of the disease is to establish clearly the causal

agents that have to be combated, for it is a fundamental bacteriological principle that these products are strictly specific, *i.e.*, a product is capable only of setting up the desired reaction on the part of the animal body when it has been manufactured from the specific causal organism of the disease or is obtained in some way by the action provoked by this organism.

The following are the organisms which have hitherto been recognised to exhibit an important causal relationship with the disease.

(i.) *Streptococci.*—The above researches would appear to indicate that these organisms account for about one-half of the total number of joint-ill cases occurring everywhere. They are found usually in great abundance in the local lesions and in a state of purity.

In ADSERSEN's investigations they were found in 50 per cent. of the whole material (123 foals of various ages were examined), and they were discoverable in the more chronic cases of joint-ill, with fatal results on an average after seventeen days. He claimed to be able to differentiate these streptococci into various types by means of fermentive reactions. Seventeen foals were said to harbour a streptococcus corresponding with the pneumonia (Schütz's) streptococcus, two foals revealed an organism corresponding with the strangles streptococcus, and three contained a mixture of both types. One of the foals that gave the strangles type of streptococcus came from a stud where strangles was present.

MAGNUSSON found streptococci in 31·8 per cent. of his cases (75 out of 236) and diplococci in 5·1 per cent. (12 out of 236); or, if we add the two sets of organisms together, which were separated apparently for no precise reason, the figure amounts to 36·9 per cent. The average age at which affected foals first displayed symptoms was twelve days for the streptococci and nine days for the diplococci; and the average age at which they died was 25·0 days for the streptococci and 13·6 days for the diplococci. It is admitted that the percentage here represented for streptococcal infections was too low, because these infections occurred in the carcases of large foals which were too big and too expensive to send to the laboratory, and also the figure might have been depressed by the fact that streptococcus sera and vaccines sent from the laboratory reduced the number of deaths due to streptococcus infections only.

MCFADYEAN and EDWARDS in the course of two years, 1918 and 1919, examined parts or whole carcases of 72 foals, and in 45 of these, or 62 per cent., streptococci appeared to be the cause of the disease. Almost all their material was, however, obtained from foals that had died after treatment with serum. But they had in mind that the percentage of cases infected with another common causative organism—*B. nephriditis equi*—in their series was probably too low, for foals infected with this organism die sooner than those infected with streptococci. They therefore concluded "that the actual proportion of cases of joint-ill caused by streptococci was somewhere between Magnusson's figures and their own, or probably about 50 per cent." They were not able to find any important differences among the joint-ill strains, or between them and other pathogenic streptococci by the ordinary laboratory methods of differential testing.

(ii.) *Bacillus nephriditis equi* (or *B. viscosum equi* Magnusson).—The characteristics of this important joint-ill organism were carefully studied by MAGNUSSON, and, as he says, "it is remarkable that such a common suppurative bacillus in foals has not been described more minutely before." It had, indeed, been isolated by MCFADYEAN as long ago as 1901 from the pus of a case of pyæmic nephritis, but his observations were not published. It was cultivated by THEILER from the lesions of pyæmic nephritis in a horse and a mule in the Transvaal in 1902, and it was afterwards studied and described by K. F. MEYER (at that time THEILER's assistant) in 1908-09, who named it *B. nephriditis equi*. In the annual reports of the Serum Institute of Rotterdam (of which POELS is director) for 1906 and 1911 cases of foals were described in which this organism was undoubtedly the cause of death, and BANG (1913) also certainly found it in the kidneys of older foals affected with worm aneurisms.

Its general importance in joint-ill was, however, first pointed out by ADSERSEN, who, in the course of complete examinations of 123 dead foals of various ages, encountered what he considered to be two main types of infection, viz., (1) the chronic type referred to above, in which a streptococcus infection was present, and (2) the acute type, with death on the second or third day as a rule, in which a specific bacillus was generally found. In all there were 31 such cases (25 per cent.), and in nearly all these an embolic nephritis was present; the navel seldom exhibited any change. In five cases embolic foci were also found in the lungs. A reddish, serous liquid was found in the peritoneal cavity, and the vessels of the intestines appeared filled with blood. The bacillus was found in abundance in the embolic foci, and also in the intima of the umbilical vessels, but it was not found in the other organs or in the blood.

In MAGNUSSON's researches this same bacillus was found in 73 out of 236 carcases, *i.e.*, in 30·9 per cent.; and a striking feature about the infection was that the period of incubation was usually very short, and the development of the disease swift. In 69 of these cases the foal developed the disease on an average within eighteen hours after birth, and died on the third day. In the other cases there were marked exceptions to this rule, in which the foal was from eight to fourteen days old when it became ill, and died in from three to six weeks later.

MCFADYEAN and EDWARDS found the organism in eight out of their seventy-two cases (11 per cent.)—in a state of purity in five cases, in association with streptococci in two cases, and with coliform bacilli in one case. As pointed out above, they admit that the apparent percentage of infection due to this organism represented in their series may be too low, because nearly all their cases were in foals that had survived the first day or two after birth and had been subjected to serum treatment. MAGNUSSON himself suggests that his own figures are probably too high, for reasons given above, so that if an average is struck again between the two sets of figures, we arrive at 21 per cent.

From recent investigations it would appear therefore that *B. nephriditis equi* is responsible for, roughly, at least 20 per cent. of the total number of cases of joint-ill, and it would appear that it is this organism which is chiefly responsible for the disease which follows very early after birth.

MAGNUSSON's report of the disease picture caused by this organism is well worth quoting. Not less than fifty-six out of his seventy-three cases fell ill on the first day. In twenty-nine cases the owners informed him that the foal was weakly, had no desire to get up, and sucked unwillingly. In many cases the foal had to be fed on the first day with a feeding bottle containing the mare's milk. The progress of the disease was very rapid. More than half the foals, or forty-nine, died when they were two days old, showing symptoms of acute septicæmia. Only nine were more than a week old when they developed typical suppurative polyarthritis, tendo-vaginitis, and intermuscular abscesses. The navel did not, as a rule, exhibit any change. Only in four cases were inflammation of the umbilical veins and navel abscesses encountered. In about half the cases one or more of the joints had commenced to swell after the foal had been ailing some time. The disease was characterised by great dulness. The mucous membranes were discoloured. Respiration was increased, and the temperature varied between 103 and 105° F. Diarrhœa was not unusual in the most acute cases. If the foal survived the first day, local symptoms of a more conspicuous nature were then noticed. The joints became swollen, and at times pus broke out through fistula from the joints as well as the tendon sheaths. The younger the foal was when it died the less in general had been the changes.

On post-mortem examination a number of carcases in which the disease had evolved rapidly presented the appear-

ance of sepsis without any evident localisation. In the more advanced ones more or less well-developed arthrites were encountered; in thirty-three cases the synovial fluid was feculent or purulent, and in ten cases quite clear, but discoloured brown or red. The navel vessels were seldom the seat of any marked inflammatory process. The most specific changes were found in the kidneys. In fifty-six cases they exhibited more or less marked changes, and in fifty cases embolic cortical nephritis was visible to the naked eye in both kidneys. In certain foals the foci were scarcely discernible; in others, they were as large as hemp seeds. The adrenal glands not infrequently showed the same changes as the kidneys. The spleen and liver seldom showed any marked changes, although the liver was as a rule much congested, and in one case embolic white foci were found in its substance. The intestines sometimes showed intensely filled blood vessels. The peritoneum as a rule showed no changes. Pleuritis and pericarditis were rare. The lungs frequently exhibited innumerable red foci $\frac{1}{2}$ mm. in size. The heart often showed subepicardial hæmorrhages.

The bacillus could nearly always be isolated successfully from the kidneys and joints in culture. In these situations one could be sure of detecting the organism microscopically; and in the kidney foci, for example, one could always find the small bacillary rods, which lay grouped together in masses as if some mucous pulp held them together and prevented isolation. The bacillus, however, could not be found everywhere; it could very seldom be encountered in the heart blood and spleen; but in six cases the disease had been of a septicæmic character, and the bacillus was found in quite a number of situations besides the kidney abscesses and joints, such as in the blood, mesenteric lymphatic glands, and spleen.

The bacillus is a small oval rod, 1.5 to 2 times as long as it is thick; $1{\cdot}6 \times 0{\cdot}8$ to $1{\cdot}2u$; stains easily with the basic aniline dyes; Gram negative, not acid fast; non-motile; no capsule formation. Grows well aerobically and anaerobically on all the media commonly used for pathogenic bacteria. On agar plates the colonies are very characteristic, being greyish-white, semi-solid and not easily separated. They are tough, ropy or glutinous in consistence, and when one tries to transfer them with the platinum needle the whole colony comes along with the needle in the form of a sticky string. In gelatine growth takes place slowly. In broth, or better in serum glucose broth, a very good growth occurs in twenty-four hours; a sediment appears which settles at the bottom of the tube, and by shaking the tube the whole culture mass ascends in the form of a slimy cone, and when one tries to withdraw a little of it by means of a platinum loop a long mucous string about a foot or more long can often be pulled away. A few of the sugar media are fermented with the formation of acid, but no gas. The character of viscosity is the most striking feature of this organism, and serves to identify it readily in culture from the other pathogenic organisms found in the foal. The bacillus possesses only very feeble powers of resistance and rapidly dies out in cultures.

ADSERSEN first demonstrated the marked pathogenicity of this organism for foals. A six-day-old foal was given intravenously 10 c.c. of broth culture; it became ill at once and died in $3\frac{1}{2}$ days. On post-mortem examination the same changes were observed as in spontaneous cases of the disease from which this bacillus is isolated. Another foal was given 4 c.c. culture intravenously through the umbilical vein an hour after birth; it died eighteen hours later and exhibited typical lesions post-mortem. In two other foals the intravenous injection produced a rise of temperature and arthritis, and the specific bacillus was isolated from the joints of one of them. A foal fed with 100 c.c. broth culture mixed with cow's milk nine hours after birth did not develop any lesions. ADSERSEN concludes that infection in the spontaneous cases of joint-ill always takes place post-natally through the navel vessels.

MAGNUSSON inoculated a six-months old foal intravenously with 10 c.c. of broth culture of the first isolated organism; symptoms of illness were noticed in three days, and in six days the foal died, after having shown typical joint-ill symptoms; on post-mortem examination the usual lesions associated with acute cases of joint-ill were noticed, including embolic nephritis, and the organism was recovered from its lesions in a state of purity. Two other foals were inoculated subcutaneously with 10 c.c. broth culture; the following day the foals had a temperature of 103° F., and the desire for food was lost. A swelling about the size of a man's hand arose at the seat of inoculation, which developed into an abscess in three days; the abscess ruptured of itself, and healed completely after fourteen days. Even on older horses a subcutaneous injection of cultures caused similar lesions. A three days old foal was given *per os* 50 c.c. of a twenty-four hours' broth culture mixed with mare's milk. The foal did not subsequently become ill; it was kept under observation for three months. Bacterial cultures were several times injected into various experimental horses, sometimes into the conjunctival sac, sometimes into the vagina; no lesions thereby ensued. Cattle and calves were not susceptible whatever method of application was used in inoculating. The goat, pig, rabbit, and guinea-pig likewise proved refractory. White mice were susceptible to intraperitoneal inoculation. Dogs were to a certain extent susceptible in the same way as horses. MAGNUSSON, in addition, describes an interesting case of fatal wound infection in a six years old mare due to this organism, and also describes fatal cases of pyosepticæmia caused by it in older foals due to extension of infection from primary foci, which took the form of the worm aneurisms set up by *Strongylus equinum* and *edentatum* and which harboured *B. nephriditis equi*.

(iii.) *Coliform organisms*, or organisms of *B. coli communis* type.—This heterogeneous group of organisms is again found in association with a large proportion of the cases of joint-ill.

According to MAGNUSSON they were found in 64 out of his 236 cases, *i.e.*, in 27·1 per cent. As with the last described organism, the onset of disease after birth was here again rapid. The average age when symptoms were first shown was two days, and the age when the foal died was four-and-a-half days.

MCFADYEAN and EDWARDS discovered this type of organism in eleven out of the seventy-two cases (*i.e.*, in 15·4 per cent.) examined by them in 1918 and 1919. In these cases they were present either in a state of purity or so greatly outnumbering the other organisms present as to indicate that they were responsible for the lesions. They were also found in some cases in association with other bacteria. The strains isolated resembled *B. coli communis* in morphology and in the appearance of their growths in ordinary laboratory media, but cross-agglutination tests indicated that they differed from a type strain of this organism. It is also probable that they differed considerably among themselves. The special characteristics of the disease set up by this group of organisms do not yet appear to have been sufficiently studied.

If an average is again taken of the results of these two sets of investigations, we arrive at a rough average of 21 per cent.

The three forms of organisms up to now described therefore comprise at least 90 per cent. of the total number of forms associated with joint-ill. (Streptococci 50 per cent., *B. nephriditis equi*, 21 per cent., and *B. coli communis* type 21 per cent). The number of cases investigated is too small to lay any stress upon the accuracy of these figures, but, nevertheless, there is good reason for believing that they furnish a useful guide as to the relative predominance of the various main forms of infection.

Miscellaneous organisms.—Chief in importance of these, perhaps, is the organism which is also the common cause of contagious abortion in mares, the *Bacillus abortivo-equinus*, and this organism merits special consideration, inasmuch as it appears from recent bacteriological investigation that it is the only one which gains access to the foal's body pre-natally. The organism is closely related to the paratyphoid group of organisms, and is readily distinguished in the laboratory on account of the peculiar wrinkled growth it usually forms on agar. It has been identified as the cause of outbreaks of abortion

in mares in many parts of the world, and is found in abundance everywhere in the body of the aborted foal. A number of investigators have also isolated this organism from the local lesions of foals that have lived and subsequently developed joint-ill, viz., POLJAKOW (1904) in Russia, DASSONVILLE and RIVIÈRE (1913) in France GOOD and SMITH (1904) in the United States of America, SCHOFIELD (1914) in Canada, and MCFADYEAN and EDWARDS (1917) in Great Britain. It is very important to note that where this organism is found in foals cases of infectious abortion have occurred among the mares in the stud from which these foals were obtained.

In the report published by MCFADYEAN and EDWARDS in 1917 on "Contagious Abortion in Mares and Joint-Ill in Foals," information was given concerning ten foals which had been born dead or had died from joint-ill; in all eight cases examined in 1917 the organism was cultivated from the heart blood, liver, spleen, and other internal organs, and in the case of the foals that had been born dead, also from the contents of the stomach and intestines. In six out of these eight cases it was cultivated from the liquid of one or several joints, and three of these had been born dead and free from any sign of joint infection. In two cases that had died of joint-ill the organism was found in the local lesions associated with streptococci. The information to hand at the time, especially in view of the results obtained by other workers, made it "more than reasonable to conclude that it was the actual cause of abortion and joint-ill." Subsequent investigations, however, did not bear out this belief, for out of the seventy-two cases examined by these authors in 1918 and 1919 the bacillus of mare abortion was found twice only in the lesions of joint-ill, and both these cases came from a stud in which mares had recently aborted.

In 1917 some German authors published observations that would appear to indicate that *B. abortivo-equinus* is not invariably associated with joint-ill even in studs where mare abortion is rampant. PFEILER found the organism apparently to be the cause of infectious abortion in mares in Germany. The aborted foals were, as a rule, dead. Those born alive were weak and suffered from bloody diarrhœa. If joint-ill was present, it was generally caused by other bacteria. MIESSNER and BERGE made a careful investigation into a severe outbreak of abortion in a German stud, in which most of the foals born alive died later of joint-ill. Out of fifty-seven fœtuses which had been aborted between the ages of four and eight months, forty-five showed paratyphoid bacilli (apparently *B. abortivo-equinus*) in abundant quantities in all the organs, especially in the stomach and intestines, four showed streptococci, four showed no bacterial flora, and four were putrid. Thirteen were born alive, and the majority of these contracted joint-ill; seven of them showed infection with streptococci, and only one suffered from infection with the mare abortion bacillus. Thus they regarded joint-ill as being caused by a virus other than that which causes abortion. MAGNUSSON does not mention any case of infection by this organism in his series. In order to determine whether foals affected with joint-ill were to any appreciable extent born from dams infected with the mare abortion organism, MCFADYEAN and EDWARDS requested the veterinary surgeons to whom they sent serum for treatment in 1918 to furnish them with a small sample of blood from the dam in each case to be tested by the agglutination test. The bloods of the nearly all dams of 250 affected foals were thereby tested, and in no case was there any evidence of infection with the mare abortion organism. It would appear therefore quite safe to assume that this organism is not to any appreciable extent a cause of joint-ill, except when this disease manifests itself in a stud coincidentally with the occurrence of an outbreak of abortion in the mares.

As miscellaneous organisms, MAGNUSSON classifies 5·1 per cent. of his cases (12 out of 236). MCFADYEAN and EDWARDS in their series of seventy-two cases encountered four in which organisms that could not with certainty be identified with any named species were present in a state of purity; the most interesting of these was a case in which a streptothrix was abundantly present, unmixed with other organisms, in the diseased joint.

How is Infection produced?

Are we to suppose that joint-ill is pre-natal or post-natal in origin? In other words, does infection of the foal take place within the womb or does it first occur after birth? Since the days when BOLLINGER demonstrated the connection between the suppurative condition of the navel and the joint lesions there had been naturally a strong tendency to look upon joint-ill as merely the result of a wound infection starting at the navel. Clinicians had, on account of the frequent association of the joint symptoms with abscesses at the navel, regarded the terms joint-ill and navel-ill as practically synonymous. The bacteriological investigations of a few years ago in which a close relationship between the condition that produced abortion in mares and the disease that appeared in certain foals that survived after birth produced in the minds of some researchers the impression that joint-ill was, after all, perhaps not post-natal in origin, but that the foal probably contracted the infection while in the womb. This impression has also gained considerable currency both in this country and abroad among general practitioners, for reasons that have been well summarised by MAGNUSSON.

(*a*) There are certain ill-fated mares which year after year give birth to foals that have perished from joint-ill.

(*b*) The disease often appears in foals so early that a post-natal infection could not have had time to develop, for every virus, of course, requires a certain period of incubation.

(*c*) Even when the navel wound has been treated with great care joint-ill has nevertheless set in.

(*d*) The same bacillus is said to have been found in the mare's vagina as that found in the lesions of the infected foal.

(*e*) Treatment of the infected foal with serum from the mare has been proved to protect the foal against the disease.

There seems to be a good deal of experience to show that joint-ill does follow certain mares. But this can be easily explained away if one admits that it is possible for mares to harbour in their intestines a virus of very high virulence and thus act as carriers of the disease. In some surroundings it may also be quite possible for the virus to persist in a state of high potency. If infection were contracted *in utero*, it would be necessary to admit that mares are frequently the subject of mild or chronic endometritis. This is not true, for mares are rarely subject to this condition, and if it did actually occur, it is more than probable, as MAGNUSSON points out, that abortion would ensue. We now know that very few of the cases of joint-ill in this country are associated with specific abortion in mares. In Sweden, MAGNUSSON was unable to attribute cases of abortion in mares to the specific agent responsible for the contagious form elsewhere, but in four out of fifty-five cases examined he ascertained the presence of a streptococcus, and in one it was a *Bacillus coli* infection. To show how sensitive the pregnant mare is to infection, he introduced into the vagina of a mare 100 c.c. of culture of these abortion streptococci; in seventeen days a dead fœtus was dropped, and in all the organs streptococci were found again.

In no case has a foal yet been discovered at birth with any developed lesions such as abscesses, or arthritis. Infection with subsequent death in a new-born foal has, however, always been a septicæmia, and ADSERSEN's and MAGNUSSON's researches have shown clearly that there are species of joint-ill bacteria capable of causing symptoms and even death within twenty-four hours under favourable conditions. None of the bacteria require a long period of incubation, although in most cases the illness is of long duration. It is therefore not necessary to invoke intra-uterine infection to explain the early deaths of the foals.

In distinction from other animals the navel wound of foals seems very easy to infect. BOLLINGER (1873) pointed out this fact, and later GMELIN (1891) described a number of cases in which the course of the infection along the umbilical vessels was followed and the anatomical

peculiarities of the foal's umbilicus that rendered it more susceptible to infection than that of other animals were explained; this worker, moreover, formulated a method of preventive treatment by antiseptic and protective dressings to the navel which is about the most thorough on record. ADSERSEN and MAGNUSSON have again lately called attention to the importance of this point. MAGNUSSON found a pronounced inflammation of the umbilical veins in not less than sixty cases. The records furnished by MCFADYEAN and EDWARDS point to navel infection in at least a corresponding number of cases. In most of MAGNUSSON's cases, and in all the acute ones, however, it was found that the bacteria had passed this channel without leaving any external signs. Bacteriological examination of the umbilical arteries and the thrombi in the umbilical vein revealed, however, in general a very rich bacterial flora. The *B. nephriditis equi* seldom caused any inflammatory lesions in the umbilical vessels, and it was not found in the thrombi there. The experiments of ADSERSEN above referred to showed, nevertheless, that cultures of this bacillus injected into the umbilical vessels produced the disease in its typical form. On the other hand, even when large quantities of culture were administered by the mouth, negative results were obtained. It is therefore more than probable, MAGNUSSON maintains, that even this organism enters spontaneously by the navel sore. The great importance of paying proper attention to the navel is therefore evident, and investigations carried out in various studs have proved that this treatment greatly diminishes the frequency of joint-ill. In many cases, however, this is impossible to do, either because a veterinary surgeon cannot always be present at the time of birth, or because it is difficult for an untrained person to do what is required, and he may "even make matters worse by careless handling of this sensitive field of operation."

It is not suggested that the navel wound affords a port of entry for infection in every case of joint-ill. Cases undoubtedly occur in which the virus enters by the intestine, as it does commonly in calf infections, and this remark refers particularly to cases caused by *B. coli* infections; for, as MAGNUSSON states, these often appear "as a severe enteritis with an attendant bacteriæmia."

And we must again remember that in a certain small proportion of cases infection is in all probability intra-uterine in origin, and these cases are referable to *B. abortivo-equinus*, the common cause of contagious abortion in mares.

Treatment.

In both preventive and curative treatment the methods which have held forth greatest promise of success are those involving the use of specific anti-sera and vaccines. These products have been issued for treatment by various investigators, and have been exploited on the market by commercial firms for some time. Since OSTERTAG stated in 1901 that streptococci were the common cause of the disease anti-streptococcus sera have been somewhat extensively employed. In Canada, SCHOFIELD claimed to have had good results following upon the use of a polyvalent vaccine. In a series of 172 foals treated the mortality was 25·5 per cent., whereas in untreated foals the mortality was said to vary between 70 and 90 per cent.

It would be convenient to consider first the methods that have been employed for curative treatment, for in this respect we now have to hand some very definite information. Before one can estimate the value of any method of curative treatment the indispensable preliminary is to have some knowledge as to what is the normal death-rate in untreated cases. Information of this kind was very difficult to obtain, and it was found that expressions of opinion by individual practitioners furnished no reliable guide. This is accounted for partly by the fact that the prevalence and virulence of the disease vary greatly in different localities and in different seasons. It was generally found that the estimates of practitioners were too high.

During the years 1917 and 1918 MCFADYEAN and EDWARDS issued to practitioners for the treatment of affected foals a serum from horses hyperimmunised with the *B. abortivo-equinus*, under the impression that this organism was, at least, a common cause of joint-ill, and that infection was contracted from the dam *in utero*. In 1917, 172 cases of joint-ill were treated, and 107 (or 64 per cent.) died. In 1918, 250 foals were treated with the same kind of serum, and of these 127 (or 50 per cent.) died. As mentioned before, tests carried out during the latter year on bloods from nearly all the dams contra-indicated infection of the mare with this organism. It is therefore assumed that the serum issued during these two years exercised no appreciable effect in the cure of joint-ill cases, and the figures in all probability represent what the death-rate would have been if the foals had been left untreated. But it was noticeable that many individual practitioners formed the opinion that this serum exercised a markedly beneficial effect. In order to demonstrate, therefore, that a serum or vaccine does exercise such an effect, it must be shown that it is capable of depressing the mortality quite appreciably below 50 per cent. when tested on a sufficiently large number of cases, in many different localities, and over a sufficiently long period of years to obviate any chance of statistical error.

The value of anti-streptococcus serum was then subjected to the test by these workers. Serum was issued from two horses that had been intensively hyperimmunised with two different strains, respectively, of streptococci isolated from joint-ill cases, and inasmuch as the supply was likely to be limited, it was not recommended for use as a prophylactic except for foals born on premises in which a case of joint-ill had occurred previously during the season. Detailed reports were obtained concerning 253 cases of joint-ill treated with the serum; the dose given was 25 c.c., repeated later, if considered necessary. Of these foals 130 died from joint-ill or had to be destroyed on humane grounds when recovery appeared hopeless. This would represent a case mortality of 51·3 per cent., a figure which is 1 per cent. higher than that obtained in the previous year, which was regarded as representing an annual mortality rate in untreated cases. This result immediately suggests that the antistreptococcus serum had exercised no beneficial effect, but before accepting this conclusion the authors invite a closer inspection of the details of the report. In the first place, they estimate the proportion of recoveries that took place when the serum had been administered at different intervals (same day, 1, 2, 3, 4, 5, 6, 7, 8-14, and over 14 days) from the onset of symptoms; for all the accredited sera are known to have a greater curative effect the sooner they are used after the beginning of the illness. The results showed plainly that there was no advantage to be gained by the early administration of the antistreptococcus serum. Moreover, during this season the joints of thirty-two foals that had been submitted to treatment were examined bacteriologically, and the number showing streptococcus infection was twenty, or 62 per cent. In the preceding (1918) season joints from thirty-seven foals were examined and streptococci appeared to be the cause of the lesions in twenty-three, again 62 per cent. The conclusion was therefore forced upon them that the antistreptococcus serum issued in 1919 had no effect on the death-rate. Moreover, there seemed to be no noteworthy differences between the fatalities that occurred and the number of actual streptococcus cases arising after the use of the sera of the two hyperimmune horses when examined separately. Again, sixty-two foals were given two or more doses of serum, and in them the mortality was 42 per cent. The lessened mortality in this respect can be accounted for by the fact that practitioners were requested not to give the second dose until after an interval of a week, and thus the majority of the acute cases would escape the second dose.

MAGNUSSON, after undertaking trials of serum and vaccine treatment of joint-ill (details concerning which, however, are not published), expresses the opinion that "the prospect of successfully treating foals already infected and showing such highly developed lesions as severe arthritis with outward fistulæ, numerous intramuscular abscesses, etc., is practically nil. Foals which fall ill immediately after birth should be treated with mixed

streptococci and coli serum, or coli serum alone, 50 to 100 grammes. Foals older than eight days should be given large doses (100 to 200) of streptococcus serum alone. The injections should be made intravenously." He admits that it is useless to treat cases infected with *B. nephriditis equi* with the specific anti-serum, for this serum failed to act even preventively. It is impossible to criticise the impression gained by MAGNUSSON with regard to the therapeutic effects of his antistreptococcus serum in the absence of published details. The evidence to hand points decidedly to the uselessness of serum treatment in declared cases of joint-ill. Even if the large doses recommended by MAGNUSSON were of any use, they could only be expected to exercise an effect on about 50 per cent. of total cases, and the effect again would only be appreciable in the milder of these cases. The difficulty could not very well be avoided by the use of polyvalent serum purporting to be specific against the whole group of joint-ill organisms, for, in general, such a serum, unless given in very large doses, would be weak against every member of the group.

Preventive treatment.—ADSERSEN produced a serum with streptococci as antigen, but could not prevent an outbreak of streptococcus infection in foals inoculated preventively with it: he therefore considered antistreptococcus serum of no value against joint-ill. ADSERSEN prepared his serum, however, from one horse only.

MAGNUSSON, in Sweden, states that in 1916 a system of combined passive and active immunising of foals was started, especially for preventive treatment. For this purpose vaccine and serum were produced from streptococcus strains isolated from cases of joint-ill, and many hundred doses were issued; he did not subsequently get to know of one single case where a foal had been inoculated preventively died of streptococcus infection. In 1917, besides streptococcic vaccines, mixed coli serum and streptococcic serum were issued.

Reports were received for 500 foals which had been treated preventively, especially such as were dropped by mares that used to have joint-ill foals. No disease was contracted by 481, while sixteen were attacked, and the presence of *B. neph. equi* was generally established, but no streptococci or *B. coli* were found in the carcases, "most of which" he examined. He therefore recommends preventive inoculation with a mixture of coli serum and streptococcic serum, and simultaneous vaccination with streptococcus vaccines, and emphasises the need of vaccination in cases where the navel shows signs of infection, as the disease may appear when the passive immunity effects are worn off.

MAGNUSSON'S results certainly are not conclusive, inasmuch as the number of cases that died and were examined post-mortem, even if "most of them" were examined, is not sufficient to warrant a decisive opinion on the merits of the treatment.

In MCFADYEAN and EDWARDS'S researches the number of cases treated preventively was not considered sufficient to hazard a definite opinion. Permission was given to use antistreptococcus serum for healthy foals born at any place where a case of joint-ill had occurred during the season, but in a number of cases the serum was given to healthy foals irrespective of this condition.

In the series of 253 cases treated curatively, there are included five cases in which the serum had also been used preventively; in three of these the attack proved fatal, although one or more doses of serum were given after the disease developed, and two of these proved to be cases of streptococcus infection. In two of the five cases, however, the first symptoms were not shown until a month after the serum was injected, and so it would be unfair to cite these cases as evidence of failure of the preventive treatment.

In view of the failure of curative treatment with streptococcus serum, these authors maintain that the value of this serum as a prophylactic ought to be regarded with a certain degree of distrust, for as yet there is no definite evidence as to the natural case mortality in joint-ill, and it is therefore difficult to judge the value of any prophylactic agent. Such information could be obtained from the large breed societies in the country if statistics were kept covering a number of years. Again, the treatment would have to be carried out on a large scale on account of the erratic incidence of the disease in small studs in different years.

This year an invitation has been issued by Sir JOHN MCFADYEAN to veterinary surgeons to co-operate with him, largely with a view to obtaining this information and exploiting further means of prophylactic and curative treatment, and an offer has been made to supply vaccine gratis for the mares and foals of any member of the Shire Horse Society who cares to apply for it. This vaccine is to be employed (1) either for the treatment of mares before foaling; (2) for the treatment of foals immediately after birth; or (3) for the treatment of foals attacked with the disease. The object is to have the value of the vaccine put to proof on a large scale, and Sir JOHN MCFADYEAN states that he is anxious that members of the profession should take the matter up and apply direct for the vaccine.

Protection of the foal by immunisation of the dam has lately acquired some prominence. Not that there are any grounds for believing that this is likely to diminish the incidence of joint-ill by lessening the chances of prenatal infection, for, as we have seen, infection of the foal while in the womb is hardly ever likely to occur except in studs where contagious abortion co-exists. The logical basis for such intervention would lie in the fact that anti-bodies are manufactured or produced in the mare's blood which would pass into the body of the fœtus and confer on it for a short while after birth a passive immunity. If produced in sufficient quantity, there is some reason to suppose that these might exercise an appreciable effect on the foal also when taken by the mare's milk. An analogy may be found in the case of rinderpest, where it has been shown that calves born from and sucking immune dams are themselves passively immune during the sucking period. It would be extremely hazardous to lay too much emphasis on such a transference of anti-bodies in the case of streptococcal infections, and the method requires a great deal of investigation before it can be recommended in current practice. We are mindful in this connection of the good results claimed to have been obtained by PEGGIE in prophylactic treatment; this worker inoculated the dam at certain intervals before birth and again the foal at intervals after birth with streptococcus serum. His results were, however, obtained over a short period, with a comparatively small number of animals, and in a restricted locality. For reasons enumerated above, each of these factors is liable to give rise to a misleading interpretation.

The so-called FORSELL method of treating the foal with its mother's serum appears to have been largely practised in Sweden and in Germany, and the German investigators at all events seem to be convinced of the value of the method. It is just possible that the foal may derive great benefit from the anti-bodies which may be present in the mare's blood, for it may be claimed that a full-grown animal has in the course of years gone through quite a number of infections, and has certainly developed anti-bodies of different kinds. Whether they are present in sufficient quantity to be of any therapeutic account is at present highly problematical, and as MAGNUSSON maintains the good results claimed to have been obtained do not always stand the test of close criticism.

In the present state of our knowledge there is as yet no justification for abandoning the care of the navel—a method of prevention the value of which has been firmly established by a prolonged and varied experience.

The essayist then read the description of the method of treating the foal's umbilicus originally given by GMELIN (*Jl. Comp. Path. and Ther.*, 1892, Mar., pp. 20-21), which is as follows:—

"As soon as the foal is born the umbilical cord is washed with sublimate lotion and then, about 2 cm. under the sharply marked transition from general integument to amniotic sheath, ligatured with a linen band which has been steeped in sublimate lotion. Before tightening

the ligature one waits until the pulsation in the umbilical arteries has ceased, or until the movements of the foal or the efforts of the mother to get up require the manipulation to be hastened. Should the mare not lie down in the act of parturition, the foal must be caught and held by attendants. When the pulsation has ceased the ligature is drawn tight, and the navel-string is severed with clean scissors below the ligature; the stump of the umbilical cord is then washed with sublimate lotion, and, according to Franck's recommendation, its cut surface and the part of it included in the amniotic sheath are brushed over with concentrated carbolic acid. On the morning after the birth the foal and its mother are transferred to the stable for mares and foals. Here it is cast on a clean bed, the long hairs around the navel are clipped off, the entire umbilical region is washed with sublimate lotion, and the ligature is tested as to its position and tightness, and, possibly, renewed. The cut face and epidermis-free part of the stump are again brushed over with concentrated carbolic acid. This is repeated daily until transverse cracks appear where the amniotic sheath joins the cutaneous navel, which occurs about four or five days after birth.

"In consequence of the brushing over with carbolic acid the remnant of the navel-string acquires a parchment-like character. One does not wait until the fissures become deep and the stump of the navel-string is cast off, but cuts off the latter with the scissors. In consequence of this the navel ring bleeds a little, but the hæmorrhage soon ceases. The navel ring is now disinfected and carefully dried, and a stiff zinc-gelatine dressing in which 1 per cent. of sublimate is dissolved is painted on the wound. More consistence is given to the gelatine dressing by mixing with it some fibres of wood-wool. If the surface has been dry, the dressing will as a rule hold till next morning. In the case of colt foals that urinate with the penis protruding from the prepuce it is often necessary to paint on the gelatine once more in the evening. The gelatine has over other protective dressings the advantage of softening with warm water, and it is therefore easily removed without irritating the skin during the process. After the lapse of 1-3 days an opening almost regularly appears on the navel wound; this is caused by atrophy of the connective tissue in the navel ring, retraction of the vessels, etc. The accumulation of pus in this opening must be prevented. The animal must therefore be cast every morning, the dressing removed, the cavity washed out, and, it may be, stuffed with a small dry tampion of iodoform wool, after which in every case the navel wound is again closed with gelatine. The wound quickly becomes filled with beautiful granulations; and by the 7th or 8th day the treatment may be discontinued.

"About one hour is required for the dressing of eight foals in the way here described.

"I do not wish to say that the method is very simple, and I believe that it may be to a considerable extent simplified, but it has at any rate the advantage of securing in the case of every new-born foal a daily thorough examination of the navel until that is healed. No sacrifice in time and trouble is too great to put a stop to joint-ill—the one disease of suckling animals that can be successfully combated. By treating the navel in the way above described success is undeniable. Since the introduction of the method at this stud (January, 1890) I have not lost a single foal from pyæmic navel-infection."

Discussion.

Mr. H. W. DAWES initiated a brief discussion. He first expressed his admiration for the paper, especially from a pathological point of view. A number of points hitherto obscure had now been made clear. His own clinical experience of joint-ill taught him that the disease divided itself into two classes, first, the septicæmic type, which generally occurred within 48 hours of birth, and had a high mortality rate, and secondly, the type where lesions of a suppurative nature occurred, the disease extending over a longer period. Professor Edwards had enumerated a good many organisms associated with joint-ill, and had divided them into four definite classes; but there was one which he would single out as being of importance to the general practitioner, namely, the *Bacillus nephriditis equi*. That was the organism to be isolated in the septicæmic type of joint-ill, and lack of recognition of this septicæmic form of the disease in the past was largely due to the fact that the foal died before the veterinary surgeon was called in. There was one other point in connection with that particular bacillus. Joint lameness in yearlings and two-year-olds was often of obscure origin, but for some years past several observers had come to the conclusion that the animal had been carrying the virus of joint-ill in a latent form probably from birth, but it had not previously been active. As regards the methods of infection, Professor Edwards had laid down a definite opinion, but whilst some observers held that there was a chance of the infection originating in the uterus, if they considered the pathological changes occurring in the ruptured navel, it seemed obvious that that was the point of infection. In an animal with a ruptured navel, there was thrombosis of the umbilical vessels, followed by suppurative disintegration and dissemination in the blood stream. With regard to the question of preventive treatment, most of them had tried all the well-known methods. There were some elaborate ways of dressing the navel, as they had heard from Professor Edwards, but in spite of the most careful disinfection, they kept getting cases of joint-ill. There were practitioners who in their own districts enjoyed a certain amount of success in the treatment of joint-ill, and in spite of Professor Edwards' condemnation of the streptococcic serum, he would find that many practitioners claimed that it was a very valuable form of treatment.

Mr. HUGHES, who referred to the high literary standard attained by the essayist, said he was greatly interested in the statistical analysis of the cases that had been investigated, and also in the thoroughgoing manner in which they had had the serum treatment brought before them. They might hope for some success from the vaccine treatment, but Professor Edwards had not told them the composition of the vaccine which was now being employed. He regretted to see that the profession had been circularised with regard to this vaccine along with members of the Shire Horse Society. As the vaccine was being distributed free, perhaps one ought not to criticise the situation unduly, but unless this philanthropy was to be continued in perpetuity, they might very well ask themselves what was to be the future policy? If the vaccine proved a success, would it be issued direct to the horse-breeding public, or would its distribution be confined to members of the veterinary profession? He noticed that it was an instruction that a veterinary surgeon should be called in to inject the vaccine, but if it was to be sent direct to the laity, after the veterinary surgeon had injected the first few doses, they would see the stud groom buying a hypodermic syringe and doing the thing himself. Unless there was proper precaution, the very use of the vaccine might be in itself a danger. Could Professor Edwards say whether the joints themselves constituted a predilection seat on account of the presence of synovia, or was there any peculiarity in the functions of the joints which would tend to arrest the bacteria passing through? One other point occurred to him, and that was, should the preparation of these biological products be controlled? In the United States this method of treatment was more in vogue than it was here, and the different manufacturers operated under licence from the Government. That was a question that would loom up larger in the future, when the Ministry of Agriculture came to realise the danger of allowing the manufacture and sale of vaccine to be untrammelled and uncontrolled.

Mr. J. THOMSON said that after using the mixed vaccine he had had 75 per cent. of recoveries.

Mr. REYNOLDS confirmed what the previous speaker had said with regard to the issuing of vaccine to members of the Shire Horse Society. He had used vaccines with

a fair measure of success, but he was sorry to say he had no record of his cases.

Mr. MARTIN, Sen., emphasised the importance of careful attention at birth. He believed there was a strong feeling all through the country against this vaccine being placed in the hands of laymen, not only because it was injurious to the interests of the veterinary profession, but also because if the public tried to use it themselves they might do more harm than good.

Professor EDWARDS, replying to the discussion, said he had treated the subject particularly from a pathological point of view. For three years the study of bacteria in joint-ill cases had been one of his chief occupations, and he therefore much appreciated the able manner in which Mr. Dawes, who was evidently a keen observer, had discussed his paper. Mr. Dawes raised a point in connection with the use of anti-streptococcic serum, and said it appeared favourable in many cases. That was no doubt true. He had examined reports sent in by clinicians on the use of the serum sent out by the Royal Veterinary College, and they often appeared very satisfactory. Still, on collating the facts, they got figures which were just the same as in previous years. Mr. Hughes asked why bacteria settled in the joints. No doubt the joints were predilection seats, but this was a term which was often used to cover one's lack of knowledge. Why the joints should be predilection seats he could not say, but bacteria when they reached the joints evidently found conditions there which were congenial. Whether it was the nutriment obtained there or the conditions of the circulation was not clear. The vaccine would naturally be composed of the commonest type of organism mentioned in the paper. Should these biological products be controlled? That was a political question and *à priori* the answer should undoubtedly be in the affirmative. He had been asked a delicate question as to why this vaccine had been sent out to horse owners. "I do not know," continued Professor Edwards; "I should think the object, without doubt, is to get the vaccine tested on as large a scale as possible, but I am sure the very last thing the investigators desire is to irritate the practitioner in any way. We in the laboratories depend on the practitioner for the material wherewith to prosecute our studies, and it is highly essential that all practitioners should collaborate with us as much as possible in order to solve this burning question of joint-ill. They will readily understand that it is further necessary to enlist the sympathies and active co-operation of horse-owners to this end.

Mr. J. THOMSON: As a matter of fairness to Sir John McFadyean, I should like to state that when a horse owner in my district applied for some vaccine, Sir John asked him the name of his veterinary surgeon. It happened to be me, and Sir John sent the material on to me direct.

Professor EDWARDS: That is what Sir John McFadyean would do.

Test of the Roaring Operation.

By Major H. ALLEN, R.A.V.C., and Captain G. A. KELLY, R.A.V.C.

The efficacy of the roaring operation, otherwise known as arytenopexy, or Williams' operation, for roaring in solipeds, which consists in the resection of the mucous membrane from the laryngeal saccule, with the object of fixing the arytenoid cartilage by means of the ensuing cicatrix was tested by us in the Remount Depot, Saharanpur, India, between April, 1920, and November, 1920. Thirty-one "bad" roarers were operated upon with the following results:—

Complete Cures ...	11	out of	28	... 39·3%
Decided Improvement (partial recoveries) ...	7	,,	28	... 25·0%
No Improvement ...	10	,,	28	... 35·7%
Destroyed and Cast for other reasons ...	2			
Died, result of snake-bite	1			
Total ...	31			

	Total.	Cured.	Improved.	No improvement.	No history.
Arytenopexy of left ventricle	23	9	5	8	1
Arytenopexy of both ventricles ...	8	2	2	2	2
	31	11	7	10	3

Total 31.

REMARKS. All these cases were proved to be chronic ("Bad") "Roarers" by successive examinations.

One month's complete rest was allowed after the operation in a loose box.

Afterwards all cases were transferred for two months to "Liberty" paddocks.

All cases were re-examined after three months.

The successful cases were given another three months at "light" work and re-examined before issue to the service.

Improvement was noticed to be most marked at the second examination.

TUBERCULOSIS COMPENSATION CLAIM.

Before the Alfreton (Derbyshire) magistrates recently, George Evans, a farmer, claimed £20 compensation from the Alfreton Urban Council in respect of the carcase of a cow seized by the Council's sanitary inspector as unfit for human food. Evans said the cow was examined by a veterinary inspector for the Sheffield Corporation, in whose area he supplied milk, and found to be tubercular, certain organs being locally affected. The veterinary inspector, however, gave a certificate that the carcase was fit for human food, with the exception of the diseased parts. Later Evans sent the animal to a butcher to be slaughtered, and the veterinary officer confirmed the opinion he previously expressed. The Alfreton Council's sanitary officer, however, seized the meat, and it was condemned, but before this, however, the butcher had sold the carcase.

For the Council it was contended that, as the carcase had been sold when it was seized, plaintiff could not claim compensation. The Bench upheld this view, and dismissed the case. An application by the Council for costs was, however, refused.

The Veterinary Record.

19th March, 1921.

CONTROL OF THERAPEUTIC SUBSTANCES.

In April last a Departmental Committee was appointed by the Minister of Health "to consider and advise upon the legislative and administrative measures to be taken for the effective control and authenticity of such therapeutic substances offered for sale to the public as cannot be tested adequately by direct chemical means." This Committee has now issued a report of its proceedings, with recommendations.

We notice that though the terms of reference only mentioned therapeutic substances, the Committee interpreted these as including prophylactic and diagnostic agents, the use of which is of such importance in medicine. The substances considered can be classified into three groups:—

(*a*) Biological products, *i.e.*, vaccines, serums, toxins, antitoxins, and analogous products;
(*b*) Potent synthetic remedies, such as salvarsan;
(*c*) A group including what are generally considered to be "drugs," *e.g.*, digitalis, squill, ergot, cannabis indica, pituitary gland preparation, etc.

Twenty witnesses were examined, including several representatives of firms engaged in preparing these substances.

The report deals with the necessity for controlling the manufacture and distribution of these products, and lays stress upon the importance of the purity, potency, and authenticity of the first group. The Committee realised the difficulty of testing such substances as serums and vaccines, but considered that a system of licensing and inspection of premises and processes should go hand in hand with the testing of the finished product.

The report then treats of substances in Group B, *i.e.*, salvarsan and its analogues. These bodies share with those in Group A the disability of exclusion from the British Pharmacopœia, which, of course, is the recognised standard for medicines in this country. At the present moment, as a measure temporarily won, the manufacture of salvarsan is, under licence, permitted by the Board of Trade. Attached to the licence are certain conditions, one of which has reference to the price, while another stipulates that samples of the products must be submitted to the Medical Research Council for testing. Not only is this arrangement liable to termination, but, strangely enough, it does not apply to the imported article. Therefore the Committee are of opinion that the manufacture should be continued under licence, and that the finished products should undergo chemical, physical, and biological tests before being issued for use.

With regard to the drugs in Group C, it is well known that many manufacturers issue their preparations as "physiologically standardised." But this, in our opinion, does not go sufficiently far, for each maker has his own ideas with regard to the potency of his preparation, and, indeed, the report suggests that the preparations should be subjected to definite and uniform tests, so that the variations in strength which are the inevitable consequence of different methods of testing would be avoided.

The legislative and administrative machinery necessary to give effect to the recommendations are next considered. Whether the Privy Council or the Ministry of Health be the controlling authority is immaterial, but it would be necessary for a body to be appointed to decide, among other matters—

(1) What substances should be subjected to these methods of control from time to time;
(2) What methods of standardisation and testing should be employed.

The report *in toto* makes interesting reading, and if the suggestions are carried out in the proper spirit, we are convinced that they will prove of general benefit to the practice of medicine. It cannot be denied that at present there are on the market products, falling into these groups, which are certainly not above suspicion, either as regards their genuineness or their utility.

The Committee did not read such an elasticity into their terms of reference as to concern themselves with the sale of these products. Evidently they hold that this is already sufficiently safeguarded by other means, such as the laws relating to poisons, the enactments controlling the administration of certain noxious drugs, and, of course, by the discretionary powers of the doctor, the veterinarian, and the pharmacist.

Sussex Cattle in South Africa.—**The suitability of Sussex cattle to the African climate has long been recognised, and proof of their popularity is furnished by the prize schedule of the fifteenth annual show of the Witwatersrand Agricultural Society, to be held at Johannesburg towards the end of March. No fewer than thirteen classes have been set aside for the breed, and it is reported that the entries this year constitute a record. In addition to the class prizes, there are numerous gold medals and challenge cups offered, amongst them being a challenge cup for the best Sussex bull in the show.**

Abstracts and Reviews.

The Implantation of Sexual Glands.

This short article in a Belgian medical paper, by an American surgeon, is due to the author's resentment that the recent clamour in the popular press about "interstitial rejuvenation" has been in connection with the work of VORONOFF, of Paris, and STEINACH, of Vienna, and without mention of his own name.

He claims priority for introducing the method of hormonetherapy through the implantation of an endocrine organ, taken from one human subject into another human being whose corresponding organ is deficient.

He states that an implanted gland very soon obtains a new circulation. Examination of a transplanted testicle four months after the operation revealed the interstitial cells in full process of proliferation, the seminiferous tubes were persistent; only the spermatogenic epithelium had disappeared. Nevertheless, there seems to be a gradual atrophy of the implanted tissue.

It is necessary to consider three distinct elements in the action of implanted glands:

(1) The initial dose of sexual hormone contained in the gland at the time of the implantation.

(2) The production of new hormone by the interstitial cells. This production continues as long as the smallest particle of glandular tissue persists.

(3) The process of digestion of the different proteids of the graft by the tissues of the stock leads to the production of an enzyme of which the power for stimulating the nutrition of all the body cells is remarkable.

The author cites one or two cases:—A patient, 35 years old, had had his testicles removed five years earlier, on account of tuberculosis. He had a feminine appearance, due especially to accumulation of fat which rounded his figure. A year after the testicular implantation he had lost 26lb. weight, his physical appearance was again masculine, and the patient himself states that physically, sexually and mentally he felt like his original self before castration became necessary.

A patient, 34 years old, presented marked feminine characteristics; no beard, scanty hair on pubis, falsetto voice. The penis and testicles were as those of a year-old child. He was melancholy, mentally and physically deficient, and, of course, sexually inactive. A single testicle from a young man dead from a fractured skull was implanted. Two months later a wonderful improvement was obvious; axillary, pubic and even facial hairs were more luxuriant; in fact, regular shaving was necessary. The patient was far more active and less melancholy. He was taking a keen interest in business, felt sexual desire, and contemplated marriage.

The author is enthusiastic, then, about the possibilities of gland transference; especially when the source of the graft belongs to the same species as the patient. As source of material he suggests men which have died *suddenly*, as from traumatism, drowning, gas asphyxia, or hanging.

He states that without doubt senile individuals can to a certain extent be rejuvenated by being grafted with the testicle of a young and vigorous man. In one observed case there was a marked change in the colour of the hair, eyebrows, and even beard, which modification was maintained for some years. In addition, the physical, mental and sexual activities of the man were improved.

G. FRANK LYDSTON, *Archives Médicales Belges*, 1920, *November*, pp. 909-915.

H. E. H.

Anthrax Vaccines.

The Division of Veterinary Education and Research has prepared a new vaccine against anthrax. This so-called spore-vaccine has been tried at the Laboratory on a fairly large number of animals (horses, donkeys, cattle, sheep, and goats) with excellent results. The chief advantages are the following:—(1) The vaccine seems to be perfectly harmless, so that no evil results need be feared after inoculation if the instructions are carefully carried out. (2) The degree of immunity conferred by this new vaccine seems to be very much stronger than that which followed on the inoculation with the old vaccine. Animals were inoculated with the prescribed doses, and were then tested with varying amounts of virulent anthrax germs to see whether they could resist the infection. An example of such a test may be quoted. A sheep was inoculated with a single dose of the vaccine ($\frac{1}{2}$ c.c.) and showed no symptoms at all. A month later it received an injection of 100,000 virulent anthrax spores without showing any reaction. It is mentioned that in the case of susceptible sheep, fifty virulent anthrax spores generally form a fatal dose.

Before issuing this spore-vaccine to the public the Division intends to test it on a fairly large scale on a few badly-infected farms (probably in the Boshof district). As soon as this test is completed the vaccine will be ready for issue to the farmers.

A printed leaflet will accompany each batch issued, and farmers will be requested to fill in two forms and return them to the Laboratory four weeks and one year respectively after the inoculation. In this manner it will be possible to collect valuable information on the results obtained with the new vaccine. It is hoped that every farmer will co-operate and assist the Division in its endeavour to check the spread of this dreadful disease in South Africa.—*Jl. Department of Agriculture, S. Africa.*

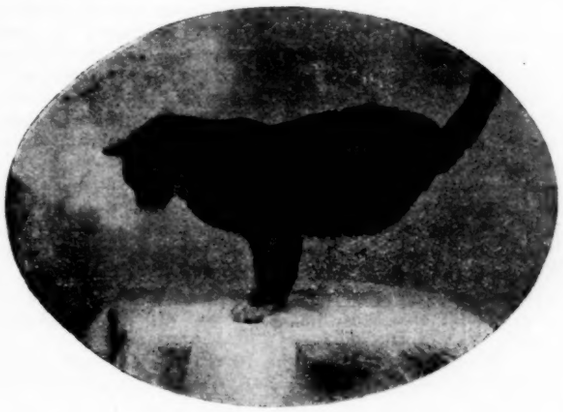
Clinical and Case Reports.

Dipygusamelus in the Cat.

By D. BROWN, M.R.C.V.S., Kilwinning. *Case exhibited before the West of Scotland Division of the N. V. M. A.*

Subject.—Black and white male cat, four years old, showing total absence of both hind legs also pelvis; born in this condition. Can run about actively, jumping from height, but cannot climb. Runs down stairs but has difficulty getting upstairs, accomplishing this slowly. On examination,

vertebrae seemed normal, but no trace of pelvic girdle felt. Contents of abdomen and normal pelvic contents supported by quite normally developed abdominal muscles. No rupture ; testicles apparently in abdomen, cat behaving as entire.



Ventral Hernia in a Colt.

Case operated on by PROF. HOBDAY *in the surgical demonstration made to the members of the R.C. V.M. A., at Reading, on January 28th.*

Described by Mr. ROBERTS prior to operation.

On the 26th August colt lay down on piece of sharp glass in a field, sustaining small wound in flank. For a day or two went on quite well. Depth of puncture unknown ; no probing or exploring. In four or five days the temperature went up and appetite wrong. Exploration disclosed an enormous quantity of blood clot. No swelling from outside. Blood clot taken out ; subject did badly for weeks. On September 19th chloroformed ; big opening made, half gallon blood clot removed ; seton put in to keep open. Afterwards he did well. Temperature had been 105 and 106 for a number of days. Three months later, after colt had been turned out for two or three weeks, hernia noticed at end of incision made through skin to remove blood clot. Presumably muscular walls weakened, perhaps degenerated, owing to inflammatory processes, but another colt might have kicked him.

External Carotid Abnormality.

By Prof. B. GORTON, M.R.C.V.S., Royal Veterinary College, London.

The following abnormal arrangement of the external carotid artery of the horse was seen in a dissecting pony at the Royal Veterinary College, London, recently. The abnormality only affected the left-hand side. The common carotid divided into its three terminal branches at the usual place. The external carotid, instead of continuing the direction of the parent trunk, turned downwards to the angle of the jaw, then outwards to reach the lateral surface of the tendon of the occipito-mandibularis. In this part of its course the pharyngeal, lingual and facial arteries were given off in order, and also branches to the internal pterygoid muscle.

After gaining the lateral aspect of the tendon of the occipito-mandibularis, the artery passed vertically upwards at the posterior border of the masseter, which it supplied, under cover of the parotid gland to reach the usual position of its division into superficial temporal and internal maxillary. These arteries were normal. The most remarkable feature of the arrangement was that the artery was for about six inches (at the posterior edge of masseter) quite superficial, being covered only by the skin, fascia, and the thin anterior border of the parotid gland.

Association Reports.

Midland Counties' Veterinary Medical Association.

The annual meeting of this Association was held at the Grand Hotel, Birmingham, on Friday, February 11th, when Mr. R. H. H. Over, President, took the chair. The other members present were Messrs. R. C. Trigger, H. E. Powell, W. H. Brooke, H. L. Pemberton, R.L. Green, H. S. Reynolds, D. Forwell, H. Yeomans, S. M. Woodward, J. Young, J. Martin, senr., and J. Martin, junr., L. S. Tipper, W. G. Thompson, B. DeVine, M. Sadler, H. Tudor Hughes, A. B. Forsyth, W. White, J. Robertson, P.M. Evershed, R. Murray, W. F. Aston, W. J. Dale, J. Thomson, H. B. Hiles, J. O. Powley, F. O. Taylor, T. Chambers, F. Chambers, H. W. Dawes, and the Hon. Secretary (H. J. Dawes,). The visitors present were Professor J. T. Edwards (London), Messrs. J. Basil Buxton (London), H. Howie (Birmingham), R. P. Holmes (Birmingham), R. E. Murison (Shrewsbury), and Douthwaite (Coleshill).

Apologies for absence were received from Sir John McFadyean, Sir Gilbert Barling, Professor Hobday, Messrs. F. L. Gooch, Lindsay, H. A. Turner, J. J. Burchnall, A. W. Findlay, T. H. L. Duckworth, C. J. Byner, C. L. Hunting, W. W. Grasby, B. Secker, J. R. Carless, S. Hobson W. Tart, F. Hall, F. O. Steward, R. Hughes, T. J. Brain, W. T. Olver, C. Ringer, Trevor Spencer, P. C. Woolston, R. McGregor, E. Franklin, J. Whyte, L. W. Heelis, G. Prickett, G. Barham, C. Haywood, J. C. Cormack, R. P. Palmer, A. Over and others.

After the minutes of the previous meeting had been passed, nominations for membership were received from Messrs. McKenzie (Market Drayton), Peach (Barton-under-Needwood), Murison (Shrewsbury), Howie and Holmes (City of Birmingham Veterinary Department).

Mr. J. F. CARTWRIGHT (Wolverhampton) and Mr. R. G. J. Lake (Ashby-de-la-Zouch), who were duly nominated at the previous meeting, were now unanimously elected members of the Association.

The HON. SECRETARY read a circular from the Royal Sanitary Institute, inviting the Association to send delegates to the next annual Congress to be held at Folkestone, in June next.

The PRESIDENT elicited that Mr. DeVine might be attending the Congress and he expressed the hope that he would consent to represent that Association.

Help for the National.

The HON. SECRETARY read the following letter from Mr. B. Buxton, the General Secretary of the N.V.M.A. :—

Dear Mr. Dawes,—The "National" is receiving excellent support from members of the profession and now that it has acquired its own journal should be in a position to do good work for its members. In order that the just benefits of co-operation may be assured, I am particularly anxious to obtain a membership which shall entitle us to say that the Association is representative of the veterinary profession.

Will you please use your utmost endeavours to persuade every member of your society to become immediately a member of the Association.

My idea is that in the event of the necessity for co-ordinated action arising which may happen at any moment, it should be possible for the divisions to send delegates to a central conference where a definite line of action could be decided upon. The delegates already exist in the form of members of the Council of the N.V.M.A. who represent the various divisions.

It is, however, impossible for the executive of the National to say that they represent the profession unless the great majority of the members of the local associations are members of the main body. It is essential to the well-being of the profession that the membership should be immediately and considerably increased. The possession of its own journal is a very powerful adjunct to the resources of the Association, and I am particularly anxious to increase the size and scientific value of the *Veterinary Record* at the earliest possible moment. This, however, depends entirely upon the support given by individual members of the profession and I am convinced, that knowing this, veterinary surgeons in your division will not hesitate to give the Association that immediate support which is of such vital necessity to it.

The Association cannot take the necessary steps in several directions until:—

(*a*) It can claim to be truly representative of the veterinary profession.

(*b*) Acquire sufficient funds to enable it to build up the necessary reserve for unforseen expenses connected with its several enterprises.

(*c*) Increase the size, scope, and power of its journal, and

(*d*) Establish itself as the recognised mouthpiece of one of the indispensible sections of the community.

In other words, the future value of the National to the members of the veterinary profession will be in direct proportion to the support which it receives from those members and that support must be given freely and NOW.

Finally may I remind you that all the officials of the Association act in a purely honorary capacity and that no part of the funds is employed in paying salaries to officials. The whole of the money obtained from subscriptions is returned to the members in kind.

If you could send me a list of members of your division who are desirous of subscribing to the Association, it would be of great service to me.—I am yours very truly, J. Basil Buxton, *General Secretary.*

Mr. Basil Buxton, called upon by the President, said the letter did not over-state the case. Until they knew how many members they might expect, the National could not do much. The *Record* was the medium by which members joined and he wanted members of the profession to send their two guineas along immediately, so that they might know for how many they had to cater. Any balance standing to the credit of subscribers to the *Record* on January 1st would be returned to them as soon as possible.

The President, in endorsing Mr. Buxton's appeal, said they could do very little politically as a profession unless they were united nationally. With a strong National Association at their back, they could accomplish much.

Mr. DeVine reminded the meeting that the *Record* had now become the organ of the profession, being owned and worked by the National Veterinary Association. For that reason, if for no other, the *Record* should command the support of every member, as it was the recognised medium through which they could voice their grievances. If the profession would back the National as it ought to, the *Record* had a good future before it.

The Hon. Secretary said the *Record* had two capable editors in Professor Edwards and Mr. Buxton, and it was an organ capable of raising the standard of the profession.

Insurance Fees.—A letter was also received from the National regarding the scale of fees for insurance work (as published in the *Record* on April 5th, 1919), but the President said they would not have time to discuss it that afternoon. It was far too big a question.

On the motion of Mr. Trigger, seconded by Mr. Daie, the matter wes referred to the Council of the Association.

Council's Critics.—The Hon. Secretary read a letter from the Mid.-West and South Wales Veterinary Association protesting against what was described as "the singular apathy towards the interests of general practitioners," on the part of the Council of the R.C.V.S., and also against "the over-representation of the schools and whole-time veterinary officers on the Council and most important committees." Accompanying the letter was a copy of a resolution and this Association was asked to pass a similar resolution.

Mr. Hughes said he thought the matter was in the hands of the profession itself when the time came round for the election of members of Council. He thought it was a pity to try and introduce a spirit of antagonism into the profession, as though there was some feud between the schools and the general practitioner.

The Hon. Secretary said it seemed to him to be eminently a matter for the National Veterinary Society to consider.

Eventually, on the motion of Mr. Reynolds, seconded by Mr. Hughes, the matter was referred to the National.

Satisfactory Financial Position.

Mr. W. H. Brooke presented his financial statement for the year ended December 31st last, duly audited by Messrs. Trigger and T. Chambers (the latter acting in the absence of Mr. F. L. Gooch). This showed receipts totalling £113 16s. 7d., the chief items being £46 6s. 5d., balance brought forward from 1919, and £62 15s. members' subscriptions. After meeting all dues and demands, there remained a balance in hand of £29 15s. 8d., together with a sum of £100 invested in War Loan.

On the motion of Mr. Trigger, seconded by Mr. Chambers, the accounts were passed.

Carriage of Instruments.—The Hon. Secretary said the carriage of instruments had now become a serious matter and in one or two cases it had actually exceeded the annual subscription of the member borrowing them. He also had to complain of the length of time which some members kept the instruments, which was not fair to other people who were waiting for them. There was a rule which said a fine of 2s. 6d. should be imposed every week instruments were kept after the first 14 days, but he had never cared to enforce it.

Mr. Trigger moved that in future the fine be enforced when instruments were kept for more than 14 days, and that borrowers be required to pay the carriage both ways.

This was seconded by Mr. Hughes and carried unanimously.

Report of Council.—The Hon. Secretary presented the minutes of the Council meeting held earlier in the afternoon. Recommendations were made regarding the appointment of officers, which were subsequently acted upon. It was mentioned that the Council invited Mr. Over to accept nomination as President for a second year, but he had declined, because he thought the honour was one that ought to go round. The Council recommended that the next quarterly meeting of the Association be held at Northampton, when Mr. J. O. Powley had kindly undertaken to read a paper on "Rabies."

On the motion of Mr. Tipper, the report of the Council was adopted.

Election of Officers.

The President moved that Mr. H. S. Reynolds, the senior vice-president, be President of the Association for the ensuing year. He said Mr. Reynolds was the son of an old member and had himself been identified with the Association for many years.

This was seconded by Mr. Forwell and carrried unanimously.

Mr. B. DeVine was elected senior vice-president and Mr. W. E. Ison junior vice-president, with the retiring president an *ex officio* vice-president.

Mr. H. J. Dawes was re-elected Hon. Secretary; Mr. W. H. Brooke, Hon. Treasurer; and Messrs. R. C. Trigger and F. L. Gooch, Hon. Auditors.

The following were appointed members of the Council: Messrs. L. W. Heelis, J. Cormack, J. O. Powley, W. Grasby, J. Martin, sen., S. M. Woodward, T. Slipper, and the officers of the Association.

Mr. Sadler proposed a vote of thanks to the officers for their services during the past year, and he paid a graceful tribute to the zeal they had all displayed in the exercise of their duties.

This was seconded by Mr. Pemberton and heartily agreed to.

The President, replying for himself and his colleagues, said it was a great pleasure to them to know that the Association continued to flourish.

The Malcolm Memorial Fund.

The Hon. Secretary reported that a meeting of the committee in connection with the above was held previous to the meeting of that Association, Mr. R. C. Trigger was appointed Chairman and Mr. Brennan DeVine, Secretary of the committee. Mr. Brennan DeVine read a list of donations already promised, and it was resolved to send out an appeal asking for donations, to the members of the R.C.V.S. The fund would be used for the education of the children of the late Mr. Malcolm.

Professor J. T. Edwards, B.Sc., M.R.C.V.S., read a paper on "Joint-ill in Foals, A Survey of Recent Examinations" (reported elsewhere in this issue), and subsequently the following members took part in the discussion: Messrs. H. W. Dawes, H. T. Hughes, J. Thomson, Reynolds, Martin (senr.).

A vote of thanks to Professor Edwards for his paper, proposed by the President and seconded by the Hon. Secretary, was passed.

Foot and Mouth Specimens.

Mr. DeVine brought some foot and mouth disease specimens, acquired in connection with the recent outbreak in Birmingham. They consisted of a hard palette from an ox, two tongues, and a mammary gland from a pig. They were examined with much interest.

The Annual Dinner.

Following the meeting, the annual dinner of the Association was held, when a short list of toasts was submitted, but the proceedings were shortened through members having to leave to catch trains. "The King," given from the chair, was first duly honoured, as was the toast of "His Majesty's Forces," proposed by Professor Edwards and coupled with the name of Capt. Murison.

Mr. Frank Chambers proposed "the Royal College of Veterinary Surgeons," and said he was glad to think the Council would soon be relieved of those financial worries which had been such a great handicap in the past.

Mr. Basil Buxton, in acknowledging the toast, said he believed theirs was the most abused of all the professional bodies. Very few realised what a large amount of time membership of the Council involved. Much of the work was not seen, as it was done in committee, the members of which were *au fait* with every phase of professional activity. Political work was outside the sphere of the R.C.V.S., but political work had to be done and to be done on national lines to be effective.

Mr. Buxton proceeded to propose "The Midland Counties' Veterinary Medical Association," which, he said, was one of the strongest and consequently one of the most influential in the country. From what he had seen that afternoon, it was an excellently managed Association and its power for good was not to be measured. He referred specially to Mr. Over, the President, and to Mr. H. J. Dawes, their Hon. Secretary, to whose untiring energy and zeal, he said, the success of their Association was mainly due.

The President suitably replied, and the other toast was that of "The Visitors," proposed by Mr. DeVine and acknowledged by Professor Edwards. The latter said the paper of that afternoon was the first he had read before an Association, and he was pleased that he had had an opportunity of attending the Midland Association.

H. J. Dawes, F.R.C.V.S., *Hon. Sec.*

Mid.-West and South Wales Veterinary Association.

The quarterly meeting of this Association was held at Gloucester, on Thursday, January 13th; Mr. W. M. Scott, F.R.C.V.S., President, in the chair.

The following members were present:—Messrs. S. Codrington; F. J. Taylor (Major), C. E. Perry, A. S. Adams, J. R. Barker, J. W. Proctor, R. Porch, J. C. Coleman, W. T. D. Broad, W. A. Welch, F. Tonar, W. D. Rees, R. Moore, W. R. Watson, J. R. Baxter, Brindley Sayer, A. O. McDowell, C. H. Delacherois, A. V. Veitch, John Buscombe, J. R. A. Jones, J. W. Hall Masheter, J. Y. Bogne, Frank V. Steward, A. E. Roberts, T. J. Brain, E. Philip Evans, J. M. Walker, G. E. Henson, H. E. Whitemore and J. J. Aveston.

Apologies for non-attendance were received from Messrs. G. H. Bishop, G. H. Williams, J. M. Stewart, W. J. Leyshon, W. D. Jordan, W. T. Edwards, L. St. Bel Golledge, R. W. Hall and J. Stanley Pike.

The minutes of the previous meeting as published were taken as read.

A letter was received from Mr. Buxton, Hon. Secretary of the National, saying he intended being present at that meeting, but was prevented by urgent business; he however, hoped to be present at their annual general meeting in April.

This information gave the members much pleasure, as a visit from Mr. Buxton could not fail to yield beneficial results for the progress of the Association.

Letters were also received from the relatives of their late members, Mr. Bath and Mr. F. Bazley, thanking the Association for the kind expressions of sympathy in their sad bereavement.

The President said he would like to mention an instance which would go to show the far-reaching effect of membership of such an Association. He did not think any of them had any conception of the benefits which were to be derived therefrom. In the case of one of their deceased members, the executors were devoid of the knowledge of how to dispose of the veterinary practice, and were thus in a somewhat helpless position, but knowing that their late friend was a member of that Association, however, they got into touch with their Secretary, (Mr. J. J. Aveston), who was able to place them in a channel whereby they were able to dispose of the practice in a satisfactory and profitable manner.

It was decided that hearty support be given to the resolution of the combined meeting of the Royal Counties, Southern Counties, and South Eastern V.M. Associations, relative to the institution of a proper system of meat inspection by veterinary surgeons in public slaughter houses.

It was proposed by the Secretary and seconded by Mr. Coleman that Mr. Scott be elected their representative on the Publication Committee of the "National."

The President referred in terms of deep regret to the death of Mr. J. Temple, of Aberaman, and he proposed that a vote of condolence should be sent to the relatives, which was passed *sub silentio*, the members standing.

The Secretary remarked that the Association had suffered a severe loss indeed, as Mr. Temple had taken a keen interest in their welfare and was instrumental in getting many gentlemen to join, and was hoping (he told him at the last meeting at Cardiff) to take a still greater interest in their affairs in future, when he was elected one of the Association's representatives on the Council of the "National."

The following gentlemen were elected members of the Association:—Mr. Lloyd and Mr. Masterman (Haver-

fordwest); Professor J. T. Share Jones (Liverpool University); Mr. R. T. Davis (Knighton, Radnorshire).

It was decided that a dinner should be held on the occasion of the Association's first annual meeting, on April 14th, at Bristol.

The following resolution was proposed by Mr. R. Porch: "That the Royal Counties V.M.A., Southern Counties V.S., and Western Counties V.M.A. be invited to combine with the Mid-West and South Wales V.A. to offer an invitation to the National Veterinary Association to hold their 1922 meeting in the West of England."

This was seconded by Mr. S. Codrington and carried unanimously.

The SECRETARY gave the Association's best thanks to Mr. Bogne and Mr. McDowell for making all the arrangements for the meeting.

The PRESIDENT read a letter from Mr. W. S. King (Limehouse), asking for his support and that of the members of that Association in his candidature for the Council of the R.C.V.S.

Mr. A. S. ADAMS then presented his paper on "Some of the Common Bovine Ailments." (See forthcoming issue of *Record*.)

The PRESIDENT proposed a hearty vote of thanks to Mr. Adams for the trouble he had taken in bringing forward such a practical paper and one which would prove of considerable value to them in every day practice. This was carried with acclamation.

Notes and News.

Royal College of Veterinary Surgeons.

The Secretary begs to acknowledge the receipt of the following subscriptions to the R.C.V.S. for the present year:—

The subscriptions and all similar subscriptions received since January 1st will be credited as the annual fee payable under the Veterinary Surgeons' Act, 1920, and due on April 1st. A free copy of the register is sent to subscribing members.

It is not proposed to continue the publication of these lists after April 1st, when the payment of the annual fee becomes due.

	£	s.	d.
Adams, A. S., Dursley	1	1	0
Anderson, W., Keith	1	1	0
Ashley, F. G., Dalston	1	1	0
Bennett, S., Cambridge	1	1	0
Bowman, G. E., Leeds	1	1	0
Broad, A., London, W.12	1	1	0
Brown, J., Stirling	1	1	0
Brown, J., Perth	1	1	0
Caldwell, J., Spilsby	1	1	0
Clifford, W. A., St. Leonards-on-Sea	1	1	0
Cockburn, H. S., Eastwood	1	1	0
Collet, H. B., Toronto, Canada	1	1	0
Cranford, R. L., Lt.-Col. R.A.V.C.	1	1	0
Davidson, G. W., Wetherby, Leeds	1	1	0
Dolan, P. F., Dublin	1	1	0
Elder, A. G., Tewkesbury	1	1	0
Elmes, G., St. Albans	1	1	0
Gentie, A. H., Otley	1	1	0
Henson, G. E., Bristol	1	1	0
Holmes, R. P., Birmingham	1	1	0
Horton, F. F., Hadlow	1	1	0
Inglis, T. M., Forfar	1	1	0
Jackson, H. E., Rochester	1	1	0
Jones, R., Towyn	1	1	0
Little, W. L., London, N.W.10	1	1	0
Lloyd, J., Forfar	1	1	0
Lyle, J., Forfar	1	1	0
McClew, A. M., Usk	1	1	0
McLaren, F. D., Beverley	1	1	0
Martin, E. S., Christchurch	1	1	0
McLean, J., Dewsbury	1	1	0
Parker, J. H., Faringdon	1	1	0
Powley, J. O., Birmingham	1	1	0
Rankin, J. D., Colne	1	1	0
Ribby, J. R., Lytham	1	1	0
Robinson, R. Craig, Carlisle	1	1	0
Scott, F. C., Pontefract	1	1	0
Sherriff, W., Stevenage	1	1	0
Turner, P. J., Glasgow	1	1	0
West, B. M. R., London, W.C.1	1	1	0
Previously acknowledged	737	5	0
	£779	5	0

Canadian Cattle Embargo.

The agitation concerning this question reached a culminating point in the series of conferences and meetings held in London during the week ending March 12th. On Tuesday, March 8th, the Earl of Crewe presided over a gathering convened by the Central Chamber of Agriculture. The lead given by the noble chairman in opposition to the promoters of the latest effort to remove the embargo ("chiefly a very local body of meat salesmen") was followed by the meeting.

The Hon. Manning Doherty (Minister of Agriculture for Ontario) travelled 4,000 miles to state his views at a meeting convened by the Canadian Cattle Association, and held under Lord Beaverbrook's presidency. Mr. Doherty maintained that since the embargo had been in force there had not been a single case of pleuro-pneumonia in the Dominion, and that there had been no case of foot-and-mouth disease in that country for a similar period. He denied that there was any fear of the disease being carried over the frontier from the United States. As to Lord Ernle's promise of 1917 (a war-time promise that the embargo might have to be removed), Mr. Doherty asserted that in view of the benefits which would accrue to the people of both countries the British Government had a duty to perform in lifting the embargo against Canadian stores.

At the Lord Mayor's conference, held in the Guildhall on Wednesday, an event attended by delegates from many interests, Mr. Doherty again listened intently to the arguments of Lord Crewe and Colonel Pretyman, and fastened on to the latter's strong argument that the security of the British breeder of the foundation stock of the world's meat supply should be maintained at all costs. "If Canadian store cattle are admitted to Britain," argued Mr. Doherty, "there will be ten times the demand for pedigree stock from the land which provides the world with the finest breeding stock in the universe." This view met with the hearty approval of the butchering element, but the farmers and the stock-breeders strongly dissented. Lord Bledisloe and Mr. R. R. Robbins, the President of the Farmers' Union, each spoke powerfully against the flood of arguments brought forward by their opponents, but when it came to voting the agricultural interests were twice beaten, by majorities of 70 to 44 and 72 to 44 respectively. The last word still rests with the Government, to whom notice of the decision antagonistic to the maintenance of the embargo was to be sent.

Heavy Losses of Sheep in Wales.

THE CAUSE AND THE CURE.

A preliminary survey of the present outbreak of liver-fluke disease has been made during the past three weeks by the Helminthologist to the Ministry of Agriculture. Severe outbreaks of the disease in its acute form have occurred in Denbighshire, Carnarvonshire, Anglesey, Flintshire and Merionethshire. The disease is taking the greatest toll of sheep in the valley farms, and it is unfortunate that at this time of the year the flocks on such farms consist almost entirely of in-lamb ewes drafted or brought from hill farms for breeding purposes. It

will be understood readily that even where early detection of the disease in a flock enables the majority of the animals to be marketed before extensive loss has taken place, the butchering of these ewes in large numbers involves extensive losses both to the individual farmer and to the community as a whole. In the present circumstances, however, the butchering of an infected flock would appear to be the safest means of cutting the loss, since in the majority of cases the infestation with the parasites is so massive and the disease is so far advanced in the whole flock as to render treatment worthless.

In the present outbreak the number of parasites gaining access to each sheep is so enormous as to bring about the death of the sheep, in the great majority of cases, before the flukes become adult or sexually mature. The symptoms and course of the disease have a tremendous range of variation depending on the varying number of cercariæ which may gain access to the liver of a sheep. The weather is the most potent determining factor. Thus in a dry season the casualties among the young snails may be enormous, but at the present moment parasitised snails are abundant all over the areas of the outbreak. In normal seasons it may be calculated roughly that about the same number of snails is present in any area, but when an exceedingly wet summer, such as that of 1920, occurs, succeeded by a very mild autumn and open winter, it follows that the casualties among the snails are not nearly so numerous, and similarly an excessively large proportion of the liver-fluke eggs reach the cercaria or infection stage. This is precisely what has happened during the present season. There is a further and even more serious consideration to be taken into account. The incidence of infection has been so high that the infection of the pastures with the eggs of the flukes will be enormous. In the event, therefore, that suitable (*i.e.*, wet and mild) conditions obtain during the year 1921, we shall doubtless be confronted with another alarming outbreak of the disease in the coming autumn. Even supposing the weather conditions should be dry and unfavourable during the coming year, the pastures will have been infected so heavily with eggs during the present outbreak that practically every snail which survives on the pastures until the autumn of 1921 will certainly be infected, and the losses from liver-fluke will undoubtedly be much heavier than in any normal year.

That the foregoing is not mere idle speculation is readily proved by reference to the official records of the disease, when it will be found that the last severe outbreak started in the autumn of 1879, and continued until the early part of the year 1881. The official estimate of the losses in sheep during these two years, which happened to coincide with the taking of the periodical census of domesticated animals, was 3,000,000. The importance of measures designed to prevent a recurrence of the outbreak during the autumn and winter of 1921-2 can thus hardly be exaggerated.

The most urgently-needed measure is the immediate undertaking of the drainage of infected land. If the ditches on the low-lying pastures are dug out thoroughly as soon as practicable, and new ones made where necessary, so that no surface water is allowed to be about the pastures in the spring and summer, this will be a great step towards the averting of an outbreak in the coming autumn. The snail lives particularly in the stagnant surface water, and is not often found in rapid running dykes and streams, so that drainage of surface water will bring about the death of immense numbers of snails. Salting the land in April or May will destroy the young snails. The amount of salt may be varied according to the wetness of the pastures—from 3 cwt. up to half a ton per acre for a very damp pasture.

Flock owners who have experienced acute outbreaks of the disease this autumn have, in the main, sent the rest of the animals to the butcher after the first losses have occurred. Where the infestation is very heavy, and this is easily estimated by the condition of the animals which die, the procedure is undoubtedly wise, but it entails considerable loss, even in the event that most of the animals are in good condition, since almost all the sheep on lowland pasture in the autumn and winter are in-lamb ewes. A farmer who has taken such action would do well not to re-stock until some frost or dry weather has been experienced, and he would be well advised to complete drainage of infested pastures and dress them with salt before again bringing sheep on to them. He may utilise such pastures for hay or for rearing calves, or whatever alternative purposes his practical knowledge of farming suggests. Where the tenant of infested land keeps ducks, he would be assisting the destruction of snails by allowing his ducks to feed over the infected areas. The ducks will eat large numbers of the snails.

At the present the Ministry of Agriculture is experimenting with certain preparations of antimony and other drugs in the treatment of the disease, and will be glad to give full information to the veterinary surgeon attending infected flocks which it may be proposed to treat medicinally. Certain other experiments are being undertaken with a view to determining if possible the exact degree of resistance of the infective stage or cercariæ to adverse weather conditions. It is hoped to publish a further leaflet on the subject during the summer.

Revised Sheep Dip Regulations.

The Ministry of Agriculture has revoked, as from the 1st December last, the Orders requiring the compulsory general dipping of sheep in this country, involving a single dipping or (in Scotland and the North of England) two dippings, at long intervals. The Ministry recognises, however, that local authorities and sheep owners in various parts of the country may wish to continue the general compulsory dipping of sheep in their districts as a safeguard against the risk of the introduction of the disease to their flocks, and powers have accordingly been given enabling them to do so. The Ministry desires, nevertheless, in this connection, to emphasise the fact that in the event of any local authority deciding to exercise these powers, nothing short of double dipping in a dip approved by the Minister, with an interval of not less than ten and not more than fourteen days between the dippings, would, in the considered opinion of the Ministry, serve the purpose in view.

A conference on louping-ill or "trembling" in sheep was held in the Town Hall, Castle-Douglas, on Monday of last week, when an address was given by Professor Gaiger, of the Glasgow Veterinary College. The meeting was held under the auspices of the County Council, and Mr. James M'Queen, of Crofts, Chairman of the Executive Committee under the Diseases of Animals Act, presided over a large attendance.

If proof were needed of the shortage of sheep in this country, it is amply proved by the figures of stock sent during recent years to the Northampton cattle market, one of the most important in the provinces. These figures show that in 1920 the consignment of sheep dropped to 71,343, a decrease of no fewer than 21,942 on the previous year. On the other hand, the number of pigs sent to the market nearly doubled, and cattle increased by nearly 24,000.

The epidemic of sheep and cattle stealing in and around Dublin is very serious, and the Cattle Traders' and Stock-owners' Association is anxious to assist in suppressing this form of crime.

The South of Ireland Dairy Shorthorn Breeders' Society have asked the Department to speed up research work in connection with contagious abortion in cattle and to establish a station in Munster for this purpose.

A Wendlebury (Oxon) farmer was fined £20 at Bicester Petty Sessions for ill-treating a sheep by causing it to be driven when suffering from a broken leg.

Irish Exports Resumed.

The announcement that the restrictions on the export of stock from Ireland terminate on March 5th is certain to be received with satisfaction by everybody, says the *Farmer's Gazette*. The report of the disease outbreak at mid-January caused much consternation, and in some cases loss to those engaged in the shipping trade, and owners also felt the effect of the embargo by a temporary drop in prices. Happily the energetic action of the Department's veterinary staff has succeeded in stamping out the disease, and has thus quickly removed a potential source of danger to Irish stock-owners. On the other hand the *Freeman's Journal* remarks: "The new order purporting to relieve the restrictions on cattle exports, which comes into operation on March 5th, was described as being most unsatisfactory, and to all intents and purposes useless from a trade point of view, by leading exporters in Dublin who were interviewed by our representative. Under the order store cattle cannot be shipped from Dublin to any market in England, but can only be sent subject to being licensed for removal from the landing ports in England to farms. Though the provisions of the order, as published, were known in the Dublin Cattle Market, it made no appreciable difference in the sales. It was pointed out to our representative, that unless an exporter got an order from an English individual or firm, there was no use in his sending the cattle across, as they had to be sent on license and subjected to many restrictions."

Parasitic Mange Prosecutions.

At Walsall Police Court, on February 25th, William Middleton, haulier, High Street, Bloxwich, was summoned for having in his possession a horse affected with parasitic mange without giving notice to the police.

Inspector Cooke spoke to Mr. Wright's visiting the farm and seeing a brown mare with hair off in several places, and he ascertained that Mr. Wright had only purchased it four days previously from the defendant. When witness saw defendant he said he knew the animal shed its coat every year. Some blacklead had been smeared over the naked patches.

Mr. A. E. Paley, M.R.C.V.S., said the animal was suffering badly from parasitic mange, and from some skin disease. It had been suffering from the disease for some three or four weeks, and by removing it from one district to another the disease was likely to be transmitted.

Mr. Frank Cooper, who defended, said Middleton had kept horses for forty years without complaint. The animal in question had been in his possession since 1913, and every year it had shed its coat in a peculiar manner. He sold the animal for farm work because it was not quite fit for the road.

Defendant said he put blacklead on the animal, as he was told it would make hair grow. When he sold the animal he suggested that a veterinary surgeon should examine it if there was the slightest doubt respecting the trouble from which it was suffering. The animal shed its coat every spring.

Mr. G. A. Phillips (presiding magistrate): I should like to know when the spring begins?

Mr. Cooper: It has certainly begun this year. I don't know when it begins in normal years.

In fining defendant £10, Mr. Phillips said the magistrates regarded this as a serious case, seeing that defendant knew a good deal about horses.

At Mansfield (Notts), on February 25th, a farmer and his son were each fined three guineas and costs for failing to report the presence of parasitic mange amongst their horses.

Bull Registration Proposal.—Means for speeding up the improvement of dairy stock have been considered by the Lancashire Agricultural Committee, and it has been decided to make representations to the Ministry on the matter. Support is also to be given to a resolution from the Chorley Bull Society, urging that, in order to hasten the grading up of commercial cattle and thereby secure an increase in home-produced meat and milk, the Ministry should take steps to prohibit the use of low-grade sires so commonly used in dairying districts by milk-producers who, whilst often buying a good class of cow for their own purposes, have little or no interest in the calves they breed. The committee is of opinion that one method of giving effect to this resolution would be to make the registration of bulls compulsory, as in the case of stallions.

Recompense for Disease Confiscation.

"For a long number of years," says the *Meat Trades Journal*, "successive Governments have repeatedly repudiated any liability for compensation for confiscation on account of disease in animals. Each has shielded itself behind the excuse that it is a trade risk and the trade should pay, yet condemnations are made for the benefit of the public, and the public should do so. There are varying opinions on the policy of allowing diseased meat to be eaten. Some contend that there is no danger to health; others that it is best to destroy the parts affected; others the whole carcase. Butchers are not desirous of selling diseased meat, they only want sound, and, as for inspection, they welcome it. Still, it is the standard of meat inspection that is at fault and the administration as well. We require in this country uniformity of meat inspection, under direct Government supervision, not local, all slaughtering to be done in registered or licensed slaughter-houses, and butchers licensed also. Then we should have some control over the meat supply to the public. Then we come to the question of who should pay for carcases condemned. The butcher says he should not because he has no knowledge of disease.

He buys the best animal in good faith and considers he is entitled to an healthy one without having to pay a premium for insurance. The farmer asks who is going to compensate him for his losses if he gives a warranty. He buys his store cattle without any guarantee, and he rightly believes that he cannot be expected to give a guarantee to the butcher. Then we come to the Government, who also deny liability. To our way of thinking the Government are morally responsible for adequate compensation for animals condemned on behalf of the public health, and should give compensation. They should provide inspectors, duly qualified, and retain control over them, because many local authorities are indifferent to their duties.

Veterinary Notes in Parliament.

Dangerous Drugs Regulations.—Farmers and the Dangerous Drugs Act.—Mr. Shortt, in answer to Lt.-Col. Guinness, stated, on February 28th, that he proposed to insert words in the regulations expressly authorising the supply of drugs for the purpose of the treatment of animals on the prescription of a veterinary surgeon. Further details as to the application of the regulations to agriculture were under consideration in consultation with the representatives of the agricultural interest.

Sheep Scab Increase.

A conference of representatives of local authorities in all the Scottish counties north of Perth was held in Aberdeen recently to deal with sheep-dipping regulations as a preventative against scab, which is on the increase. It was agreed to reject the Government proposal to have a double dip within a period of 14 days, and instead to arrange compulsory single dips in periods from July 1st to August 31st and September 1st to November 30th. This means a slight extension of the periods under the old regulations.

LATEST RETURNS OF CEREAL CROPS.—The Ministry of Agriculture and Fisheries has received the following information from the International Agricultural Institute at Rome. The wheat crop of Argentina is estimated at 23 million quarters against 26.6 million quarters last season, and an average of 20.3 million quarters.

The yield of cereals in those countries which so far have published complete returns is as follows, in million quarters:—

	1920-21.	1919-20.	Average 1914-15 to 1918-19.
Wheat	331	319	334
Rye	49	56	63
Barley	99	87	102
Oats	345	287	324
Maize (Northern Hemisphere only) ...	406	366	353

The figures for maize in the Southern hemisphere are not yet available.

As compared with last season, winter sowings have decreased by 3 per cent. in the United States, but a full area has been planted in Belgium, Spain and the United Kingdom.

SERIOUS SHEEP OUTLOOK.

We are not among those who feel alarm at the decrease in the numbers of our cattle, as shown by the last Agricultural Returns; for we believe this decrease to be of a purely temporary nature, which will very soon right itself, says the *Agricultural Gazette*. With the decrease in sheep, however, we are much more concerned, for the extent of the shortage is much more serious, and it cannot be so easily made good as in the case of the cattle.

It is the sheep of the arable land that show the greatest decrease, and here, undoubtedly, it is labour that is the determining factor. There is a good deal of labour connected with the keeping of sheep upon arable land; and sheep-breeding has suffered both from the lack of sufficient labour during the war and from the raising of wages and shortening of hours that have taken place during the last two years.

Whether the difficulties thus caused can be overcome remains to be seen. Tending sheep, particularly a breeding flock, is one of those occupations which, like many others connected with farming, cannot be made to conform to factory hours and regulations. This will be recognised by everyone before long, as it is already by the shepherds themselves; and when that is the case things will become easier for the sheep-farmer. The fall in the price of wool has, of course, been a serious disappointment; but if confidence were restored in the prospect of a fair level of prices for mutton, and for the corn that the keeping of sheep assists in producing, as well as in a more reasonable attitude on the part of the Trades Unions, we believe sheep-farming would once more improve.

England's First Calf Club.—In the beginning of last month, Hemyock, in Devonshire, established a Calf Club, the first of its kind in this country. The idea of the club comes from America, and its adoption in England is full of promise to the dairy industry. Under a well-considered scheme, the club is composed entirely of the sons and daughters of local farmers, and the ages of the twenty-one members vary from fourteen to eighteen years. Each member receives a calf, for which the parents give a promissory note, and will have charge of it for a year, when all the calves will be examined by experts and prizes will be awarded to those members who obtain for their animals the highest number of points. If the rearers then wish to retain the calves, they may do so, on redemption of the promissory notes. If they do not wish to keep them, the calves will be put up for auction and members will receive the difference between their original and present value. The calves, which are shorthorns, have been selected from cows with good milk records, from 600 to 1,000 gallons annually.

The U.S.A. initiated this policy of thus practically interesting children in live stock.

Home Drug Cultivation.—In his Presidential address before the meeting of the British Pharmaceutical Conference at Edinburgh in 1912, the late Sir Edward Evans said, with reference to the cultivation of medicinal drugs in this country: "The soil seems adaptable for this purpose, as what it does produce, for instance, digitalis, henbane, colchicum, valerian, and belladonna, to say nothing of peppermint, lavender, etc., is superior to any produced elsewhere."

Correspondence.

Letters to the Editors should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

Police Court Fees.

Sirs,—I have read with great interest and no little surprise Capt. Hamilton Kirk's letter in your issue of the 5th inst. I heartily endorse most of the remarks contained therein, but am surprised to learn that there are veterinary surgeons who will consent to attend the Police Court and give expert evidence for 15s.

In pre-war days I have never given evidence for less than a guinea, and now-a-days get two guineas. This is general in this district I think. This I have fixed as my fee for this service whether I be called in by a client or other person.

Capt. Kirk very rightly says that the service is not "overpaid" at 15s.; and I would never consent to act for such a sum.—Yours faithfully, GEORGE W. DUNKIN, Major, M.R.C.V.S., D.V.H. Liv., Canterbury.

March 7th, 1921.

Army Veterinary Service.

THE LONDON GAZETTE, WAR OFFICE, TERRITORIAL FORCE.

March 9th.—R.A.V.C.—Capt. T. J. Kenny (late R.A.V.C.) to be Capt., with precedence as from June 19th, 1917 (Feb. 24th); Capt. T. J. Kenny is appointed to command a Mobile Vety. Sect. (Feb. 24th); the notification regarding Capt. A. J. Hines, which appeared in *Gazette* Jan. 25th, is cancelled (substituted for that which appeared under heading of R.A.S.C. in *Gazette* of Feb. 25th).

REGULAR FORCES.

March 10th.—R.A.V.C.—Maj. A. G. Todd, C.B.E., D.S.O., relinquishes the actg. rank of Lt.-Col. on ceasing to hold the appt. of A.D.V.S. (Dec. 3rd, 1920).

March 11th.—R.A.V.C.—The following temp. Capts. relinquish their commissions on completion of service, and retain the rank of Capt.:—R. Beattie (Dec. 4th, 1919); T. Le Q. Blampied (Dec. 20th, 1919); W. Brown (Dec. 11th, 1919); W. G. Bunnell (Jan. 25th); F. Crowhurst (Nov. 29th, 1919); W. A. Dickinson (Dec. 23rd, 1919); R. W. D. C. Easom (April 1st, 1920); J. J. Farrell (Dec. 21st, 1919); C. M. Flanders (Feb. 28th, 1920); T. Kelleher (Jan. 18th, 1920); R. J. Little (Jan. 9th, 1920); C. K. Lomas (Jan. 4th, 1920); A. H. McDougall (Jan. 13th, 1920); A. V. Meeke (Jan. 11th, 1920); H. V. M. Metivier, O.B.E. (Dec. 11th, 1919); E. A. Pearce (Nov. 28th, 1919); W. H. Priston (Jan. 8th, 1920); S. R. Rippon (Jan. 25th); Z. B. Rutherford, O.B.E. (Oct. 19th, 1919); R. C. Scott (April 1st, 1920); J. A. Shannon (Dec. 12th, 1919); F. W. Thompson (Feb. 7th, 1920); W. B. Towell (Nov. 18th, 1919); W. Walker (Oct. 17th, 1919); L. P. Weidenbach (Dec. 23rd, 1919).

THE STUDENTS' CORNER.*

The hon. sec. of the Royal Veterinary College (London) Students' Union has addressed a communication to the secretary of the N.V.M.A. stating that in order to assist those students who may desire to see practice during the vacations, the Union is opening a register wherein are recorded the names, experience and requirements of such students, and a complementary register of those gentlemen who would be willing to receive them. The writer asks for co-operation, and adds: "There are many students who are not in touch with practising veterinary surgeons, and, I suppose, many practitioners who number no students among their immediate acquaintances, but who, if the matter were brought to their notice, would be willing to assist a student in this respect.

The Council of the Union would therefore esteem it a favour if you would place this before your members, and forward to me the names and addresses of such gentlemen as it may interest."

Impatient students were noisily closing their note-books before the professor had finished speaking. "Just one minute, gentlemen," said the lecturer, "I have a few more pearls to cast."

Heard at the free Clinique.—Rough-looking person: "It's about this 'ere dorg, sir, he jumps and coughs, then he coughs and jumps, then he jumps and then—" Professor: "Yes?" Rough-looking person: "The missus wants to know, sir, does he cough because he jumps, or does he jump because he coughs?"

Towards the close of another "Rugger" season, naturally enough the Royal Veterinary College (London) R.F.C. glances back on its achievements, successful or otherwise, and indulges in comparisons with its own past record and with that of similar teams. At present our victories are balanced by our defeats. We hope that the few remaining fixtures will weigh the scale down well in our favour, but on the whole the record is disappointing. Reasons for this are not far to seek—the unkind may call them excuses—but nevertheless the lack of funds and consequent difficulty in obtaining a good ground with adequate accommodation render an enthusiastic club almost an impossibility. Without enthusiasm a club is worthless. It is not sufficient for the team alone to display interest, and surely a College such as ours should be able to run a second XV. The team played well at the majority of the matches, and as is not unusual rose to its greatest height of achievement against strong opponents, but too great confidence proved its undoing in other games. We look forward, however, to next season, in the hope that funds will render possible the provision of an attractive ground, and that the club will benefit by a corresponding increase of keen members.—M. G. CATMUR, *Hon. Sec.*

We noticed several students partaking of luncheon in the dissecting room the other day. While admiring their courage, both moral and physical, we fear that one of these days there will be an accident. Imagination dreads the sequelæ of the possible biting out of a large lump of six weeks' old kidney, plentifully injected with Reckitt's blue and arsenic, by some absent-minded gentleman.

A professor recently likened his class to "a lot of rabbits." It certainly is no uncommon occurrence for some of the bridge-playing members to be "skinned."

We hear of a student who was having a bit of a tussle extracting a bone from a cat's throat, and that he extracted the bone all right. Unfortunately it was one of the cat's own cervical vertebræ.

* It is the Editor's intention to devote some space in the *Record* weekly to items of interest to Students at the Colleges.

Diseases of Animals Acts, 1894 to 1914. Summary of Returns.

Period.	Rabies. Cases Confirmed. Dogs.	Rabies. Cases Confirmed. Other Animals.	Anthrax. Outbreaks confirmed.	Anthrax. Animals attacked.	Foot-and-Mouth Disease. Outbreaks confirmed.	Foot-and-Mouth Disease. Animals slaughtered as diseased or exposed to infection.	Glanders (including Farcy).* Outbreaks reported by the Local Authorities.	Glanders (including Farcy).* Animals attacked.	Parasitic Mange. Outbreaks reported by the Local Authorities.	Parasitic Mange. Animals attacked.	Sheep Scab. Outbreaks reported by the Local Authorities.	Swine Fever. Outbreaks confirmed.	Swine Fever. Swine slaughtered as diseased or exposed to infection
GT. BRITAIN.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Week ended 12th March, 1921...	1	...	14	15	...	..	...	...	59	85	18	17	3
Corresponding Week in 1920	...	...	11	12	..	...	1	1	98	185	9	29	15
Corresponding Week in 1919	3	..	3	3	2	32	...	...	152	272	6	38	15
Corresponding Week in 1918	...	...	3	6	...	...	2	4	111	236	12	24	19
Total for 11 weeks, 1921 ...	15	1	157	183	24	2326	2	5	920	1477	303	239	57
Corresponding period in 1920	3	...	104	131	39	2001	9	16	1608	2927	232	476	171
Corresponding period in 1919	22	2	43	61	19	1033	1	1	1845	3740	177	238	84
Corresponding period in 1918	...	...	71	83	...	...	7	28	1638	3196	189	166	68
IRELAND.									Outbreaks				
Week ended 5th March, 1921			...	...	...	...	...	...	2	10	4	18	
Corresponding Week in 1920 ...			...	...	...	...	...	...	7	15	1	...	
Corresponding Week in 1919 ...			...	...	...	...	1	1	5	7	3	4	
Corresponding Week in 1918 ...			1	1	...	...	...	...	1	4	1	3	
Total for 10 weeks, 1921			...	...	2	41	...	...	28	104	16	104	
Corresponding period in 1920 ...			...	...	...	...	1	2	41	97	2	4	
Corresponding period in 1919 ...			...	...	...	...	1	1	35	98	12	42	
Corresponding period in 1918 ...			1	1	...	...	...	...	38	123	4	22	

NOTE. The figures for the current year are approximate only. *Excluding outbreaks in Army horses.

NOTE.—The figures for the current year are approximate only.

Department of Agriculture and Technical Instruction for Ireland (Veterinary Branch), Dublin, 7th March, 1921.